



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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| (54) Title: ELECTRONIC PROGRAM GUIDE WITH RELATED-PROGRAM SEARCH FEATURE<br>(54) Titre: GUIDE DE PROGRAMMES ELECTRONIQUE COMPORTANT UNE FONCTION DE RECHERCHE DE PROGRAMMES ASSOCIES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |           |                                                                                                                                   |
| (57) Abstract<br><br>A system for searching for programs is provided. The system may be provide the user with an opportunity to indicate an interest in a given program. The system may provide the user with an opportunity to request that the system locate programs that are related to the given program in which the user has indicated an interest. The system may locate program listings that are related to the given program. The located program listings may be related to the given program based on attributes of the given program. The system may display a list of located listings and allow the user to select listings from the list. The system may tune to a program selected from the list, may display an information display screen for a program selected from the list, etc. The system may provide the user with an opportunity to configure and save search parameters. The system may sort related program listings based on the attributes of the given program. The system may provide the user with the opportunity to retrieve saved searches to locate currently available program listings and the opportunity to delete a saved search, rename a saved search, receive automatic notifications of programs matching a saved search, etc. |  |           |                                                                                                                                   |
| (57) Abrégé<br><br>L'invention concerne un système de recherche de programmes, qui offre à un utilisateur la possibilité de manifester un intérêt dans un programme donné, de demander audit système de repérer les programmes associés au programme donné, pour lequel l'utilisateur a manifesté un intérêt. Le système repère ensuite les listes de programmes associés au programme donné sur la base des attributs de ce dernier, et affiche un registre des listes repérées, permettant à l'utilisateur de faire une sélection parmi celles-ci. Le système se branche alors sur un programme sélectionné dans le registre et affiche un écran d'informations concernant le programme sélectionné, etc. Ce système offre encore à l'utilisateur la possibilité de configurer et de sauvegarder les paramètres de recherche, et classe les listes de programmes associés sur la base des attributs du programme donné. Ce système offre enfin à l'utilisateur la possibilité d'extraire des recherches sauvegardées afin de repérer des listes de programmes disponibles actuellement, de supprimer ou de renommer une recherche sauvegardée, de recevoir des notifications automatiques relatives à des programmes correspondant à une recherche sauvegardée, etc.         |  |           |                                                                                                                                   |

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| (51) International Patent Classification 7 :<br><br>H04N 5/445                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | A1 | (11) International Publication Number: WO 00/33573<br><br>(43) International Publication Date: 8 June 2000 (08.06.00)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| (21) International Application Number: PCT/US99/28402                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    | (81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). |
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| (54) Title: ELECTRONIC PROGRAM GUIDE WITH RELATED-PROGRAM SEARCH FEATURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| (57) Abstract                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    | 50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| A system for searching for programs is provided. The system may provide the user with an opportunity to indicate an interest in a given program. The system may provide the user with an opportunity to request that the system locate programs that are related to the given program in which the user has indicated an interest. The system may locate program listings that are related to the given program. The located program listings may be related to the given program based on attributes of the given program. The system may display a list of located listings and allow the user to select listings from the list. The system may tune to a program selected from the list, may display an information display screen for a program selected from the list, etc. The system may provide the user with an opportunity to configure and save search parameters. The system may sort related program listings based on the attributes of the given program. The system may provide the user with the opportunity to retrieve saved searches to locate currently available program listings and the opportunity to delete a saved search, rename a saved search, receive automatic notifications of programs matching a saved search, etc. |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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**Description**

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ELECTRONIC PROGRAM GUIDE WITH  
RELATED-PROGRAM SEARCH FEATURE25  
Background of the Invention

This invention relates to interactive television systems such as interactive television program guide systems, and more particularly, to techniques for program searching in these systems.

Cable, satellite, and broadcast television systems provide a large number of television channels.

Typically, the number of channels provided by cable and satellite systems is over a hundred and ever increasing. Television viewers have traditionally consulted printed television program schedules to obtain programming information. More recently, interactive electronic television program guides have been developed to allow television program information to be displayed on viewer television equipment.

Interactive electronic television program guides ("program guides") typically provide program listings for all channels available in the television system. Some program guides include features for allowing users to search for programs. Such search

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10           features are often complex, time-consuming, and  
          cumbersome. For example, such search features may  
          require that a user select search parameters such as  
          preferred programming genres before searching for  
5            programs, that a user navigate through several display  
15            screens before being allowed to initiate a search, that  
          the user enter at least a portion of a program title to  
          initiate a search, etc.

20           It is therefore an object of the present  
10           invention to provide a television system that includes  
          an improved program searching feature.

25           Summary of the Invention

          These and other objects of the invention are  
          accomplished in accordance with the principles of the  
15           present invention by providing a system for searching  
          for programs. The system may provide the user with an  
          opportunity to indicate an interest in a given program.  
30           The system may provide the user with an opportunity to  
          request that the system locate programs that are  
          related to the given program in which the user  
20           indicated an interest. The system may locate program  
          listings that are related to the given program. The  
          located program listings may be related to the given  
          program based on attributes of the given program.

40           The system may display a list of the located  
          program listings. The system may provide the user with  
          an opportunity to select from the list of related  
          programs. The system may tune to a program selected  
45           from the list, may display an information display  
          screen for a program selected from the list, etc.

50           The system may provide the user with an  
          opportunity to configure search parameters. For  
          example, The system may present the user with a list of

10 attributes for the given program and may allow the user to select one or more attributes and may allow the user to select which logical operations (e.g., and/or operations) are to be performed on the attributes. The 5 system may search television program listings and may 15 display a list of related programs based on the selected attributes.

20 The system may sort related program listings based on the attributes of the given program. The 10 system may provide the user with an opportunity to save 25 search parameters for use at a later time. The system may display a list of previously saved searches and may provide the user with an opportunity to direct the system to locate currently available program listings 15 based on a saved search from the list. The system may locate currently available listings based on the user- 30 selected search parameters from the saved search when the saved search is retrieved. The system may allow the user to delete a saved search. The system may 20 automatically display a notification based on user- 35 selected search parameters from a saved search. The system may provide the user with an opportunity to view the user-selected search parameters for a saved search.

40 Further features of the invention, its nature 25 and various advantages will be more apparent from the accompanying drawings and the following detailed 50 description of the preferred embodiments.

45 Brief Description of the Drawings

FIG. 1 is a diagram of an illustrative 30 interactive television program guide system in accordance with the present invention.

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10 FIG. 2 is a flow chart of illustrative steps involved in providing program searching in accordance with the present invention.

15 FIG. 3a is a flow chart of illustrative steps 5 involved in providing an opportunity to request that the system locate programs related to a given program in accordance with the present invention.

20 FIG. 3b is a diagram of an illustrative sequence of illustrative display screens for providing 10 an opportunity to request that the system locate programs that are related to a given program in accordance with the present invention.

25 FIG. 3c is a diagram of an illustrative sequence of illustrative display screens for providing 15 an opportunity to request that the system locate programs that are related to a given program in accordance with the present invention.

30 FIG. 3d is a diagram of an illustrative sequence of illustrative display screens for providing 20 an opportunity to request that the system locate programs that are related to a given program in accordance with the present invention.

35 FIG. 3e is a diagram of an illustrative sequence of illustrative display screens for providing 25 an opportunity to request that the system locate programs that are related to a given program in accordance with the present invention.

40 FIG. 4 is a flow chart of illustrative steps 45 involved in displaying program listings that are 30 related to a given program in accordance with the present invention.

45 FIG. 5 is a diagram of an illustrative sequence of illustrative display screens for displaying 50

10 program listings that are related to a given program in accordance with the present invention.

15 FIG. 6 is a flow chart of illustrative steps involved in displaying program listings that are related to a given program based on user-selected 5 search parameters in accordance with the present invention.

20 FIG. 7a is a diagram of an illustrative sequence of illustrative display screens for searching 10 for program listing that are related to a given program based on user-selected search parameters in accordance 15 with the present invention.

25 FIG. 7b is a diagram of an illustrative sequence of illustrative display screens for displaying 15 program listings that are related to a given program based on user-selected search parameters in accordance 30 with the present invention.

35 FIG. 7c is a diagram of an illustrative sequence of illustrative display screens for searching 20 for program listings that are related to a given program based on user-selected search parameters in accordance 35 with the present invention.

40 FIG. 8a is a diagram of an illustrative sequence of illustrative display screens for searching 25 for program listings that are related to a given program based on user-selected search parameters in accordance 45 with the present invention.

45 FIG. 8b is a diagram of an illustrative sequence of illustrative display screens for selecting 30 a program listing that is related to a user-selected program in accordance with the present invention.

50 FIG. 9 is a flow chart of illustrative steps involved in providing display screens when a user makes

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10                   selections from a related-program find display screen  
                  in accordance with the present invention.

15                   FIG. 10a is a flow of illustrative steps  
                  involved in displaying a display screen having a list  
                  5 of saved searches in accordance with the present  
                  invention.

20                   FIG. 10b is a diagram of an illustrative  
                  sequence of illustrative display screens for providing  
                  a display screen having a list of saved searches in  
                  10 accordance with the present invention.

25                   FIG. 11 is flow chart of illustrative  
                  involved in providing saved search features in  
                  accordance with the present invention.

30                   FIG. 12 is a diagram of an illustrative  
                  15 sequence of illustrative display screens for searching  
                  for program listings based on a saved search in  
                  accordance with the present invention.

35                   FIG. 13 is a diagram of an illustrative  
                  sequence of illustrative display screens for deleting a  
                  20 saved search in accordance with the present invention.

40                   FIG. 14 is a diagram of an illustrative  
                  sequence of illustrative display screens for providing  
                  an automatic notification of a program matching a saved  
                  search in accordance with the present invention.

45                   FIG. 15 is a diagram of an illustrative  
                  25 sequence of illustrative display screens for displaying  
                  search parameters for a saved search in accordance with  
                  the present invention.

50                   FIG. 16 is a diagram of an illustrative  
                  30 sequence of illustrative display screens for providing  
                  save search features in accordance with the present  
                  invention.

Detailed Description of the Preferred Embodiments

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An illustrative interactive television program guide system 50 in accordance with the present invention is shown in FIG. 1. Main facility 52 includes a program guide database 54 for storing program guide information (e.g., television program listings data, program-related information, service listings data, service-related information, pay-per-view ordering information, television program promotional information, etc.).

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Main facility 52 preferably includes a processor to handle information distribution tasks. Information from database 54 may be transmitted in parallel via communications links such as communications link 58 to multiple television distribution facilities such as television distribution facility 56. Only one television distribution facility is shown in FIG. 1 to avoid over complicating the drawings. Each communications link 58 may be a satellite link, a telephone network link, a combination of such links, or another suitable communications path. Text, graphics, and video data signals may be transmitted over link 58. If it is desired to transmit video signals over communications link 58, a relatively high bandwidth link such as a satellite link is generally preferable to a relatively low bandwidth link such as a telephone line.

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Television distribution facility 56 is a facility such as a cable system headed, a broadcast distribution facility, or a satellite television distribution facility for distributing television signals to viewers.

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The program guide information transmitted by main facility 52 to television distribution facility 56

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10 includes television program listings data such as  
program times, channels, titles, descriptions, program  
type, genre, actors, etc. Transmitted program guide  
information may include pay program data such as  
15 5 pricing information for individual programs and  
subscription channels, time windows for ordering  
programs and channels, telephone numbers for placing  
orders that cannot be impulse ordered, etc.

20 Television distribution facility 56 may  
10 distribute program guide information received from main  
facility 52 to user television equipment 58 via  
communications paths 60. User television equipment 58  
25 may be any suitable equipment for providing television  
that contains sufficient processing capabilities to  
15 monitor viewing activities, analyze these activities  
and display appropriate program listings information  
30 for the user.

Communications paths 60 may be cable links,  
fiber optic links, satellite links, broadcast links, or  
20 other suitable link, or a combination of such links.

35 Any suitable communications scheme may be used to  
transmit data over paths 60, including in-band  
transmissions, out-of-band transmissions, digital  
transmissions, analog transmissions, cable  
40 25 transmissions, satellite transmissions, over-the-air  
transmissions, multichannel multipoint distribution  
services (MMDS) transmissions, etc.

45 Communications paths 60 preferably have  
sufficient bandwidth to allow television distribution  
30 facility 56 to distribute television programming,  
program listings information, advertisements, and other  
information to user television equipment 58. Multiple  
50 television and audio channels (analog, digital, or both  
analog and digital) may be provided to user television

10 equipment 58 via communication paths 60. If desired, some of the data may be distributed to user television equipment 58 by one or more distribution facilities that are separate from television distribution facility  
15 56 using communication paths that are at least partly separate from communication paths 60.

20 The data distribution technique that is used to distribute data on paths 60 may depend on the type of information that is being distributed. For example,  
25 10 text and graphics may be distributed over an out-of-band channel using an out-of-band modulator or distributed in the vertical blanking interval lines of an analog video channel. Video information may also be distributed in this way, although large quantities of  
30 15 video information may be more efficiently distributed using one or more digital channels or streams on paths 60. Such digital channels or streams may also be used for distributing text and graphics.

35 Each user television equipment device 58 has 20 a receiver which is typically a set-top box such as set-top box 62. The receiver may also be other suitable television equipment such as an advanced television receiver into which circuitry similar to set-top-box circuitry has been integrated or a personal  
40 25 computer television (PC/TV). For illustrative purposes, the present invention will be described in the context of user television equipment 58 that uses set-top boxes.

45 Each set-top box 62 is typically connected to 30 an optional videocassette recorder 66 so that selected television programs may be recorded. Videocassette recorder 66 is typically connected to a television 68. To record a program, set-top box 62 tunes to a 50 particular channel and sends control signals to

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10 videocassette recorder 66 (e.g., using infrared transmitter 70) that instructs videocassette recorder 66 to start and stop recording at the appropriate times.

10 paths 60. If desired, such data may be transmitted over telephone lines or other separate communications paths. If features such as these are provided using facilities separate from television distribution 15 5 facility 56, some of the communications involving user television equipment 58 may be made directly with the separate facility (not shown).

20 If desired, an interactive television program 20 10 guide system may be implemented using a data-relay architecture. In such an architecture, television distribution facility 56 may serve as a data relay site and user television equipment 58 may be a data 25 destination site. For example, as television distribution facility 56 receives information from main 15 15 facility 52, television distribution facility 56 may continuously or periodically distribute information to 30 user television equipment 58. In a data-relay architecture, a program guide implemented on user television equipment 58 may use a database (e.g., 20 20 database 64) for storing program guide information at user television equipment. Program guide information may include program listings and program attributes. Program attributes may be information such as program title, program actors, program duration, program genre 40 25 (e.g., sports, comedy, movies, etc.), program channel, scheduled program duration, program rating (e.g., TV-G, PG-13, etc.), program content rating (or critics' rating or star rating, e.g., one star, two stars, etc.) and other related parameters that can be tagged to a 45 30 program. Television distribution facility 56 may also poll set-top boxes periodically for certain information (e.g., pay program account information or information 50 regarding programs that have been purchased and viewed using locally-generated authorization techniques).

10 The features of the present invention may be implemented in a client-server arrangement or in a combination client-server and data-relay arrangement. In such arrangements, the server (e.g., television  
15 5 distribution facility 56) may include a database that may include program listing information.

20 For clarity, the present invention is sometimes described primarily in the context of program guides that are implemented on user television  
25 10 equipment rather than in the context of program guides that are implemented partially on a server and partially on user television equipment or a more fully server-based architecture.

30 Each set-top box 62 preferably contains a  
35 15 processor to handle tasks associated with implementing an application on the set-top box 62 that assists the user in searching for programs. For example, a stand-alone application may be provided that supports program searching, as described more fully below. If desired,  
40 20 these tasks may be implemented using a program guide application. For clarity, the present invention will be described primarily in the context of such a program guide application and in the context of a program guide system.

45 25 Illustrative steps involved in providing program searching in an interactive television system such as interactive television program guide system 50 of FIG. 1 are shown in FIG. 2. Initially at step 80, the program guide may provide a user with an  
50 30 opportunity to request that the system locate programs that are related to a particular program (e.g., a program in which the user has indicated an interest using the system). The program guide may, at step 82, display a list of programs that are related to the

10 particular program when the user requests that the system locate programs that are related to the particular program. The program guide may include programs in the list based on criteria, such as whether  
15 5 a program is related in attribute to the particular program, whether a program is a sequel or prequel of the particular program, whether a program is in the same program series as the particular program, whether a program is a series that is related to the particular  
20 10 program, whether a program is related the user-selected program in content or subject matter, whether a program has the same actor(s), director, category, theme, or production year as the user-selected program, etc.

25 Illustrative steps involved in providing a  
15 15 user with an opportunity to request that a system locate programs related to a given program in an  
30 30 interactive television system such as interactive television program guide system 50 of FIG. 1 are shown in FIG. 3a. At step 84, the program guide may provide a user with an opportunity to indicate an interest in a  
35 20 given program. The user may indicate an interest in the given program by, for example, positioning a highlight region on a program listing for the given program, tuning the system to the given program,  
40 25 selecting that an information display screen for the given program be displayed, etc. At step 86, the program guide may provide the user with an opportunity to request that the system locate programs that are related to the given program.

45 30 Illustrative display screens of FIG. 3b, FIG. 3c, FIG. 3d, and FIG. 3e may be provided based on the  
50 30 illustrative steps of FIG. 3a. As shown in FIG. 3b, the program guide may display related program find display screen 94 for the program Seinfeld when a user

10                   presses a single user interface key while a video for  
                  Seinfeld is displayed in display screen 92. The single  
                  user interface key may, for example, be a search key of  
                  a remote control for requesting that the system locate  
5                    related programs.

15                   If desired, as shown in FIG. 3c, the program  
                  guide may display related-program find display screen  
                  90 for the program Seinfeld when the user presses a  
20                   predetermined sequence of user interface keys after  
                  navigating a highlight region on a listing for Seinfeld  
10                   in program listings display screen 88. The  
                  predetermined sequence of user interface keys may, for  
25                   example, be pressing a search key and an OK key of a  
                  remote control.

15                   A sequence of keys may be used when the user  
                  interface device (e.g., a remote control) does not have  
30                   a key dedicated to providing the user with an  
                  opportunity to request that the system locate related  
                  programs.

20                   If desired, as shown in FIG. 3d, the program  
                  guide may display related-program find display screen  
                  98 for the Knicks v. Wizards basketball game when the  
                  user presses a search key of a remote control after  
40                   navigating a highlight region on the listing for the  
25                   Knicks v. Wizards basketball game in sports category  
                  program listings display screen 96.

45                   If desired, as shown in FIG. 3e, the program  
                  guide may display related-program find display screen  
                  102 for Dateline when a user presses a remote control  
                  OK key after navigating a highlight region on related  
                  programs option 104 of information display screen 100  
50                   for Dateline. The program guide may have displayed  
                  information display screen 100 for Dateline when, for  
                  example, the user pressed an OK key of a remote control

10 after navigating a highlight region on a Dateline  
program listing, the user pressed an INFO key when  
video for Dateline is being displayed, etc. Examples of  
program guide systems with information display screen  
15 5 capabilities are provided in Rudnick et al., U.S.  
Patent Application Serial No. 09/356,268 filed July 16,  
1999, which is hereby incorporated by reference herein  
in its entirety.

20 Illustrative steps involved in displaying  
10 program listings that are related to a given program in  
an interactive television system such as interactive  
television program guide system 50 of FIG. 1 are shown  
25 in FIG. 4. At step 106, the program guide may provide  
the user with an opportunity to indicate an interest in  
15 a given program. At step 108, when the user indicates  
an interest in the given program, the program guide may  
30 provide the user with an opportunity to request that  
the system locate programs that are related to the  
given program.

20 At step 110, the program guide may locate  
35 program listings (e.g., program listings stored in a  
program guide database, such as database 64 of FIG. 1)  
that are related to the given program. The program  
guide may locate program listings based on attributes  
40 25 of the given program. For example, the program guide  
may locate program listings for programs that have an  
attribute that matches an attribute of the given  
program (e.g., a common actor, same content, same  
45 subject matter, same series, common director, same  
30 category, same theme, common production year, etc.),  
program listings for programs that have a plurality of  
attributes matching attributes of the given program,  
50 program listings for programs that have attributes that  
are related to the attributes of the given program

10 (e.g., prequels, sequels, similar content, similar subject matter, related series, etc.), etc.

15 At step 112, the program guide may display a display screen (or, if desired, an overlay) having 5 listings for programs which are related to the user-selected program. From the list, the user may find a particular program of interest to the user. The program guide may provide the user with an opportunity to select a program listing from the list at step 114.

20 10 Illustrative program listings display screen 116, illustrative information display screen 118, and 25 illustrative related-program find display screen 120 of FIG. 5 may be provided based on the illustrative steps of FIG. 4. The program guide may display information 15 display screen 118 for Star Trek: The Next Generation - Episode Y when a user selects a listing for Star Trek: 30 The Next Generation - Episode Y in program listings display screen 116 (e.g., by pressing an INFO key when a highlight region is positioned on that listing).

35 20 Information display screen 118 may include a related programs options 122 for requesting to find programs related to Star Trek: The Next Generation - Episode Y.

40 The program guide may display related program 45 find display screen 120 when a user selects the related 25 programs option 122 from information display screen 118. Related-program find display screen 120 includes a list of programs related to Star Trek: The Next Generation - Episode Y that contains: Episode K of Star Trek: The Next Generation, Episode D of Star Trek: 50 Voyager, Star Trek: Wrath of Khan, Episode Z of Babylon 5, Episode X of Babylon 5, etc. The list may have been sorted based on attributes that were used by the program guide to locate the displayed program listings. For example, the list may have been sorted based on

10 which attribute caused the match, or for example, based  
on how many attributes matched. Related-program find  
display screen 120 may include an indicator, such as  
arrow 124, to inform the user that the list may be  
15 scrolled to display further listings for related  
programs that are not currently displayed. Such an  
indicator may be used when there is insufficient space  
for displaying all the related programs in a related  
20 program find display screen.

20 10 Illustrative steps involved in displaying  
program listings that are related to a given program  
based on user-configured search parameters in an  
interactive television system such as interactive  
25 television program guide system 50 of FIG. 1 are shown  
15 in FIG. 6. Steps 126 and 128 are the same as steps 106  
and 108 of FIG. 4, respectively, and are discussed  
30 above. At step 130 of FIG. 6, when the user requests  
that the system locate programs that are related to a  
given program, the program guide may provide the user  
20 with an opportunity to configure search parameters for  
searching for related programs based on attributes of  
35 the user-selected program. At step 132, the program  
guide may then locate program listings based on the  
user-configured search parameters. The program guide  
40 25 may locate program listings from program listings  
stored in a database, such as program listings database  
64 FIG. 1. The location of the program listings  
database may depend on the communications arrangement  
45 of the interactive television program guide system  
30 (e.g., in a client-server arrangement at least part of  
the database may be located at a television  
distribution facility). At step 134, the program guide  
50 may display a display screen including on-screen  
listings for programs that are related to the given

10 program based on the user-configured search parameters.  
At step 134a, the program guide may sort the located  
listings for display based on the user-configured  
search parameters. At step 134b, the program guide may  
5 provide the user with an opportunity to select one of  
the displayed programs listings.

15 Illustrative display screen 136 and  
20 illustrative related-program find search configuration  
display screen 138 (hereinafter, configuration display  
10 screen 138) of FIG. 7a may be provided based on the  
illustrative steps of FIG. 6. The program guide may  
display configuration display screen 138 for an episode  
25 of Star Trek: The Next Generation when a user presses  
a single key of a remote control while a video for that  
15 episode of Star Trek: The Next Generation is being  
displayed. Configuration display screen 138 may  
30 contain an on-screen list of attributes for the given  
program, Star Trek: The Next Generation. The  
configuration display screen 138 may contain options  
20 for providing the user with an opportunity to assign  
various importance levels to the on-screen program  
35 attributes. The option may provide the user with an  
opportunity to assign different importance levels such  
as required, desired, ignored, or excluded to the  
40 program attributes.

45 Configuration display screen 138 shows that  
importance levels may be assigned to the program  
attributes for the given episode of Star Trek: The Next  
Generation so that when locating related program  
50 30 listings, the program guide excludes programs that are  
Star Trek: The Next Generation, ignores whether a  
program is a Star Trek program when deciding whether it  
matches, ignores whether a program is a Star Trek movie  
when deciding whether it matches, requires matching

10 programs to be science fiction, requires matching  
programs to have Patrick Stewart. Configuration  
display screen 138 may include a search option that may  
provide the user with an opportunity to direct the  
15 5 program guide system to locate program listings related  
to the given program based on the program attributes  
and their assigned importance levels.

20 Illustrative related-program find display  
screens 140 and 142 of FIG. 7b may be provided based on  
20 10 the illustrative steps of FIG. 6. The program guide  
may display related-program find display screen 140  
when, for example, the user selects the search option  
25 from configuration display screen 138 of FIG. 7a.  
Display screen 140 may include a list of programs that  
15 are related to the given program based on the search  
parameters of configuration display screen 138 of FIG.  
30 7a. The list of related programs in display screen 140  
includes the program Lifeforce, which is a science  
fiction program (a required attribute) starring Patrick  
20 Stewart (a required attribute), and includes three Star  
35 Trek movies (Insurrection, First Contact, and  
Generations) that are also science fiction programs  
starring Patrick Stewart and also starring Jonathan  
Frakes (a desired attribute). Lifeforce may be  
40 25 displayed at the bottom of the list because the other  
programs more closely match the user-configured search  
parameters.

45 Display screen 140 may include option 144 for  
displaying more program listings that are related to  
30 30 Star-Trek: The Next Generation based on the user-  
configured search parameters. Display screen 140 may  
include save configuration option 146 that provides the  
50 user with an opportunity to save the user-configured  
search parameters. The program guide may display

related-program find display screen 142 when the user  
10 selects save configuration option 146 of display screen  
140. Display screen 142 is the same display screen as  
display screen 140 except that display screen 142  
15 includes unsave configuration option 148 that provides  
the user with an opportunity to unsave the user-  
configured search parameters (e.g., delete the saved  
user-configured search parameters).

20 If desired, an arrangement such as that shown  
10 in FIG. 7c may be used to search for related programs.  
Initially, the user may indicate an interest in a given  
program by selecting a program listing for the given  
25 program from an on-screen display of program listings,  
by pressing an OK button or other remote control button  
15 while tuned to the given program (e.g., while tuned to  
the given program with a set-top box or the like), by  
30 selecting the program from the results of a search,  
etc.

A list of attributes for the given program  
20 (such as the attribute list of display screen 300 of  
35 FIG. 7c) may be displayed for the user (e.g., by the  
program guide or other interactive application running  
on the system). A moveable highlight region such as  
highlight region 302 or other such indicator may be  
40 used to provide the user with an opportunity to select  
attributes of interest to be used in searching for  
related programs.

45 As shown in display screen 304 of FIG. 7c,  
the user may select one or more attributes (e.g., by  
30 pressing a remote control OK button or otherwise  
selecting desired attributes). The system may display  
a visual indication of which program attributes have  
50 been scheduled. For example, the system may highlight  
selected attributes, may change their color, text font,

10 brightness, etc. or may display an indicator such as  
indicators 306 to indicate which program attributes  
have been selected by the user. When the user  
highlights search option 308 and presses a remote  
5 control OK button (or otherwise selects option 308),  
the system searches for program listings matching the  
selected program attributes. When plural attributes  
are selected, the search may be performed using a  
15 logical AND or a logical OR function. The search  
results may be displayed using any suitable on-screen  
arrangement and may be selectable (for more  
information, automatic tuning, etc.) if desired.

20  
25 The arrangement of FIG. 7c is merely  
illustrative. Any suitable arrangement may be used for  
15 providing an on-screen display of program attributes  
related to a selected program. The attributes may  
30 include program genre(s), actors, rating, channel,  
director, year produced, or any other suitable program  
attributes. The program attribute information may be  
20 provided with the program listings data. In a client-  
server arrangement, for example, the program attributes  
may be maintained with program listings data stored on  
a server located at a cable system headend (or at  
another suitable location). In configurations in which  
35  
40 program listings are stored locally on a set-top box or  
other user equipment, program attributes may be  
maintained locally.

45 Illustrative information display screen 150  
and illustrative related-program find search  
30 configuration display screen 152 (hereinafter,  
configuration display screen 152) of FIG. 8a may be  
provided based on the illustrative steps of FIG. 6.  
50 The program guide may display information display  
screen 150 when a user selects to receive information

10 on the Denver Broncos v. Dallas Cowboys football game.  
Information display screen 150 may include related  
programs option 154 that provides the user with an  
opportunity to request that the system locate programs  
5 that are related to the Denver Broncos v. Dallas  
Cowboys football game. The program guide may display  
15 configuration display screen 152 when the user selects  
the related programs options from information display  
screen 150. Configuration display screen 152 may  
20 include an on-screen list of program attributes that  
10 are to be configured by the user.

25 The on-screen program attributes may differ  
based on the specifics of the given program and based  
on the category for the given program. For example,  
15 for a sports category program, the on-screen list may  
include attributes that are specific to that sports  
30 program and/or include attributes that are related to  
sports programs in general. As shown, configuration  
display screen 152 may include the following  
20 attributes: other football games, NFL games, Broncos  
35 games, Cowboys games, any sporting events, football-  
related programs, programs with John Elway as guest,  
etc. The user may then configure the search parameters  
to require matching programs to be football games,  
40 desire NFL games and Broncos games, exclude Cowboys  
games, ignore whether a program is a sporting event  
when deciding whether it matches, ignore whether a  
program is a football related program when deciding  
45 whether it matches, and ignore whether a program has  
30 John Elway as guest when deciding whether it matches.

50 Illustrative related program find display  
screen 158 of FIG. 8b may be provided based on the  
illustrative steps of FIG. 6. Display screen 158 may  
be displayed when a user selects search option 156 from

10 configuration display screen 152 of FIG. 8a. Display screen 158 of FIG. 8b may include listings that are sorted for display based on the user-configured search parameters of configuration display screen 158. The 15 program guide may display program display screen 160 that contains video of a current program when the user selects a listing for a current program from the program listings contained in related-program find display screen 158. If desired, the program guide may 20 display information display screen 162 for a program when the user selects a program listing from the program listings contained in related-program find display screen 158.

25 If desired, the listings in related-program 15 find display screen 158 may include program title, air time, channel, rating, pay-per-view information, etc.

30 Illustrative steps for an interactive television system such as interactive television program guide system 50 of FIG. 1 involved in providing 20 the illustrative display screens of FIG. 8b are shown 35 in FIG. 9. At step 164, the program guide may display a display screen having on-screen program listings that are related to a given program. Step 164 may include step 166 in which the program may provide the user with 40 an opportunity to select one of the on-screen program listings. At step 168, the program guide may tune to a channel for a current program when the user selects one of the on-screen listings that is for a current 45 program. At step 170, the program guide may display an 30 information display screen for a selected on-screen listing when the user selects that on-screen listing. At step 172, the program guide may return the user to 50 viewing television or to an earlier display screen when the user exits from the display screen having the

10 related on-screen program listings (e.g., presses an exit or back key of a remote control).

15 Illustrative steps for an interactive television system such as interactive television program guide system 50 of FIG. 1 involved in displaying a list of saved searches are shown in FIG. 10a. At step 174, the program guide may provide the user with an opportunity to select a saved search option. At step 176, the program guide may display a 20 display screen having a list of saved searches when a user selects the saved search option.

25 Illustrative main menu display screen 178 and illustrative saved searches display screen 180 of FIG. 10b may be provided based on the illustrative steps of FIG. 10a. The program guide may display main menu display screen 178 to provide a main selection menu for 30 accessing program guide features. Main menu display screen 178 may include saved searches option 182. The program guide may display saved searches display screen 20 180 when the user selects saved searches option 182.

35 Saved searches display screen 180 may include a list of saved-searches that are identified on the screen using the given program title for each saved search. When two saved searches are for two programs with the same 40 title, the program guide may use numbering to distinguish the listings. If desired, the user may have been allowed to name the saved searches. For example, the program guide may have provided the user with an opportunity to enter a name (e.g., by selecting 45 30 or entering alphanumeric letters with a user interface device) for a search that a user is directing the program guide to save. The saved searches may be selected by the user to provide the user with an 50 opportunity to search current program listings using

10 search parameters that were user-configured in an earlier search of program listings.

15 Illustrative steps for an interactive television system such as interactive television  
5 program guide system 50 of FIG. 1 involved in displaying a list of saved searches are shown in FIG.  
20 11. At step 184, the program guide may display a display screen having a list of saved searches. At step 186, the program guide may provide a user with an opportunity to select a saved search. At step 188, the program guide may display a list of programs based on a search of currently available program listings with saved search parameters from an earlier search.

25 At step 190, the program guide may provide the user with an opportunity to delete a saved search from the list of saved searches. At step 192, the program guide may delete a particular saved search when the user selects to delete that particular saved search.

30 20 At step 194, the program guide may provide the user with an opportunity to select an option to view user-configured search parameters for a saved search. At step 196, the program guide may display a display screen having user-configured search parameters  
35 40 25 for a saved search when the user selects to view user-configured search parameters for that saved search. If desired, step 196 may include a step that provides the user with the opportunity to modify the saved searches.

45 30 At step 198, the program guide may provide the user with an opportunity to set (or remove) an automatic notification for programs that have been located using a saved search. At step 200, the program  
50 55 guide may display a notice that a located program is scheduled to air when the user has selected to receive

10 automatic notifications. If desired, step 200 may include a step that provides the user with the opportunity to act on it.

15 Illustrative saved searches display screen 202 and illustrative related-program find display screen 204 of FIG. 12 may be provided based on the illustrative steps of FIG. 11. Saved searches display screen 202 may include a list of saved searches and corresponding options, including a search option, for 20 each saved search. The program guide may display related program find display screen 204 when the user selects the search option for Search #4. Related program find display screen 204 may include a list of 25 current program listings based on the user-configured 15 search parameters for Search #4.

30 Illustrative saved searches display screens 206 and 208 of FIG. 13 may be provided based on the illustrative steps of FIG. 11. The program guide may display saved searches display screen 206 that includes 20 a delete option for Search #3. The program guide may 35 display saved searches display screen 208 that does not include Search #3 when the user selects the delete option for Search #3.

35 Illustrative display screen 214 and 40 illustrative saved searches display screens 210 and 212 of FIG. 14 may be provided based on the illustrative steps of FIG. 11. The program guide may display saved 45 searches display screen 210 that includes an automatic notification option for saved searches including Search 30 #5. The automatic notification option for search #5 may initially be off. The program guide may display saved 50 searches display screen 212 that includes an indication that the automatic notification for Search #5 is on when the user selects the automatic

10 notification option for Search #5 from display screen  
210. After the user exits saved searches display  
screen 212 and resumes watching television, the program  
guide may display automatic notification overlay 216 in  
15 display screen 214 when the program guide locates a  
program (e.g., the movie Terminator) using the user-  
configured search parameters for Search #5. If  
desired, the program guide may provide a notification  
display screen for the located program. The  
20 10 notification may be displayed when the program is about  
to air or is airing. The overlay 216 may include a  
tune option (for tuning to the channel airing that  
program), an information option (for display further  
25 15 information on that program), a saved searches option  
(for displaying a saved searches display screen), an  
order option (for ordering programs), etc.

30 Illustrative saved searches display screen  
218 and illustrative saved search configuration display  
screen 220 of FIG. 15 may be provided based on the  
20 35 illustrative steps of FIG. 11. The program guide may  
display saved searches display screen 220 having an  
option that provides the user with an opportunity to  
view search parameters for saved searches. The program  
guide may display saved search configuration display  
40 45 screen 222 for Search #3 when the user selects the  
option to view search parameters for Search #3. Saved  
search configuration display screen 222 may display the  
saved user-configured search parameters for Search #3,  
a modify configuration option (to allow the user to  
30 50 adjust the search parameters), and a search option (to  
search the current program listings based on the user-  
configured search parameters). If desired, the program  
guide may provide the user with an opportunity to  
modify the settings on this screen by highlighting and

10 changing them, rather than having to first select a  
"modify" option.

15 Illustrative saved searches display screen  
224 and illustrative saved search configuration display  
5 screen 226 of FIG. 16 may be provided based on the  
illustrative steps of FIG. 11. The program guide may  
display saved searches display screen 224 that includes  
a list of saved searches when a user selects a saved  
20 searches option (e.g., saved searches option 182 of  
10 FIG. 10b). The program guide may display saved search  
configuration display screen 226 when the user selects  
a saved search from saved searches display screen 224.  
Saved search configuration display screen 226 may  
25 include on-screen search settings for the selected  
15 saved search. The program guide may provide the user  
with an opportunity to navigate to any of the settings  
and to modify them. Saved search configuration,  
30 display screen 226 may include search option 228 that  
when selected, causes the program guide to display a  
20 list of matching programs, rename option 230 that  
allows the user to enter a name (or modify the name)  
35 for the selected saved search, delete option 232 that  
when selected, deletes the selected save search,  
automatic notification option 234 that provides an  
40 automatic notification of programs matching the  
selected saved search, etc. Automatic Notification  
option 234 may include an indicator 236 to indicate  
that option 234 is on.

45 The foregoing is merely illustrative of the  
30 principles of this invention and various modifications  
can be made by those skilled in the art without  
departing from the scope and spirit of the invention.

**Claims**

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What is Claimed is:

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1. A method for searching for television program listings, comprising:  
providing a user with an opportunity to indicate an interest in a given program;  
displaying an on-screen list of attributes related to the program;  
providing the user with an opportunity to select one of the attributes; and  
displaying a list of program listings related to the selected attribute.

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2. The method defined in claim 1, wherein providing the user with the opportunity to indicate an interest in the given program comprises providing the user with an opportunity to select a program listing for the given program from an on-screen display of program listings.

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3. The method defined in claim 1, wherein providing the user with the opportunity to indicate an interest in the given program comprises providing the user with an opportunity to indicate an interest in a program that is currently being displayed.

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4. The method defined in claim 1, further comprising:

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providing the user with an opportunity to select a plurality of attributes; and  
displaying in the list program listings that are related to the selected attributes.

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5. The method defined in claim 1, further comprising providing the user with an opportunity to select program listings from the list.

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6. An interactive television program guide system for searching for television program listings, comprising:

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user television equipment on which an interactive television program guide is at least partially implemented, wherein the user television equipment is configured to provide a user with an opportunity to indicate an interest in a given program, to display an on-screen list of attributes related to the program, to provide the user with an opportunity to select one of the attributes, and to display a list of program listings related to the selected attribute.

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7. The system defined in claim 6, wherein the user television equipment is further configured to provide the user with the opportunity to indicate an interest in the given program by being configured to provide the user with an opportunity to select a program listing for the given program from an on-screen display of program listings.

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8. The system defined in claim 6, wherein the user television equipment is further configured to provide the user with the opportunity to indicate an interest in the given program by being configured to provide the user with an opportunity to indicate an interest in a program that is currently being displayed.

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10. The system defined in claim 6, wherein  
the user television equipment is further configured to  
provide the user with an opportunity to select a  
plurality of attributes, and to display in the list  
program listings that are related to the selected  
15 attributes.

10. The system defined in claim 6, wherein  
20 the user television equipment is further configured to  
provide the user with an opportunity to select program  
listings from the list.

25. 11. A method for use in an interactive  
television program guide system having user television  
equipment and a remote control for interfacing with  
said user television equipment, said method being for  
30 searching for programs, comprising:

displaying a display screen that  
includes a video for a given program;  
allowing the user to use a single key on  
35 the remote control while the video for the given  
program is being displayed to direct the program guide  
system to locate program listings related to the given  
program; and

40 displaying a display screen including  
the program listings located by the system.

45. 12. The method defined in claim 11, further  
comprising sorting the program listings located by the  
system for display.

50. 13. The method defined in claim 11, further  
comprising providing the user with an opportunity to  
select any of the displayed program listings.

10 14. The method defined in claim 13, further comprising tuning to a particular program when the user selects a listing for the particular program from the displayed listings.

15 15. The method defined in claim 13, further comprising tuning to a current program when the user selects a particular one of the displayed listings that lists a current program.

20 25 16. The method defined in claim 13, further comprising displaying an information display screen that contains information related to a particular one of the displayed listing when the user selects that particular listing.

30 17. The method defined in claim 11, further comprising locating programs based on attributes of the given program.

35 18. An interactive television program guide system for searching for programs, comprising:  
40 a remote control that is configured to interface with user television equipment;  
45 user television equipment on which an interactive television program guide is at least partially implemented, wherein the user television equipment is configured to display a display screen that includes a video for a given program, to allow the user to use a single key on the remote control while the video for the given program is being displayed to direct the program guide system to locate program 50 listings related to the given program, and to display a

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- 33 -

10 display screen that includes the program listings located by the system.

15 19. The system defined in claim 18, wherein the user television equipment is further configured to sort the program listings located by the system for display.

20 20. The system defined in claim 18, wherein the user television equipment is further configured to provide the user with an opportunity to select any of the displayed program listings.

25 21. The system defined in claim 20, wherein the user television equipment is further configured to tune to a particular program when the user selects a listing for the particular program from the displayed listings.

30 35 22. The system defined in claim 20, wherein the user television equipment is further configured to tune to a current program when the user selects a particular one of the displayed listings that lists a current program.

40 45 23. The system defined in claim 20, wherein the user television equipment is further configured to display an information display screen that contains information related to a particular one of the displayed listing when the user selects that particular listing.

50 24. The system defined in claim 18, wherein the user television equipment is further configured to

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10 locate programs based on attributes of the given  
program.

15 25. A method for use in an interactive  
television program guide system having user television  
equipment and a remote control for interfacing with  
said user television equipment, said method being for  
searching for programs, comprising:

20 displaying a display screen that  
includes a video for a given program;

25 allowing the user to use a single key on  
the remote control while the video for the given  
program is being displayed to direct the program guide  
system to display a display screen containing a  
plurality of program attributes for the given program;

30 35 providing the user with an opportunity  
to assign various importance levels to the program  
attributes on the display screen; and

35 40 displaying a selectable search option on  
the same display screen as the program attributes and  
assigned importance levels that the user selects to  
direct the program guide system to locate program  
listings related to the given program based on the  
program attributes and their assigned importance  
levels.

45 50 26. The method defined in claim 25, further  
comprising providing the user with an opportunity to  
have the program guide system save the plurality of  
program attributes for the given program.

55 27. The method defined in claim 26, further  
comprising providing the user with an opportunity to  
have the program guide system save the plurality of

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- 35 -

10

program attributes for the given program and their assigned importance levels.

15

28. The method defined in claim 26, further comprising providing the user with an opportunity to delete the saved plurality of program attributes for the given program.

20

29. The method defined in claim 25, further comprising displaying a list of program listings that the program guide system located based on the attributes and their assigned importance levels.

25

30. The method defined in claim 29 further comprising providing the user with an opportunity to select program listings from the list.

30

31. The method defined in claim 30, further comprising displaying information related to a particular program listing that has been selected from the list.

40

32. The method defined in claim 30, further comprising tuning to a particular program when a listing for the particular program is selected from the list.

45

33. An interactive television program guide system, comprising:

a remote control that is configured to interface with user television equipment; and user television equipment on which an interactive television program guide is at least partially implemented, wherein the user television

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10 equipment is configured to display a display screen that includes a video for a given program, to allow the user to use a single key on the remote control while the video for the given program is being displayed to direct the program guide system to display a display screen containing a plurality of program attributes for the given program, to provide the user with an opportunity to assign various importance levels to the program attributes on the display screen, and to 15 display a selectable search option on the same display screen as the program attributes and assigned importance levels that the user selects to direct the program guide system to locate program listings related to the given program based on the program attributes 20 and their assigned importance levels.

25

30 34. The system defined in claim 33, wherein the user television equipment is further configured to provide the user with an opportunity to have the program guide system save the plurality of program attributes for the given program.

35

40 35. The system defined in claim 34, wherein the user television equipment is further configured to provide the user with an opportunity to have the program guide system save the plurality of program attributes for the given program and their assigned importance levels.

45

50 36. The system defined in claim 34, wherein the user television equipment is further configured to provide the user with an opportunity to delete the saved plurality of program attributes for the given program.

5

- 37 -

10 37. The system defined in claim 33, wherein  
the user television equipment is further configured to  
display a list of program listings that the program  
guide system located based on the attributes and their  
assigned importance levels.

15

20 38. The system defined in claim 37, wherein  
the user television equipment is further configured to  
provide the user with an opportunity to select program  
listings from the list.

25

39. The system defined in claim 38, wherein  
the user television equipment is further configured to  
display information related to a particular program  
listing that has been selected from the list.

30

40. The system defined in claim 38, wherein  
the user television equipment is further configured to  
tune to a particular program when a listing for the  
particular program is selected from the list.

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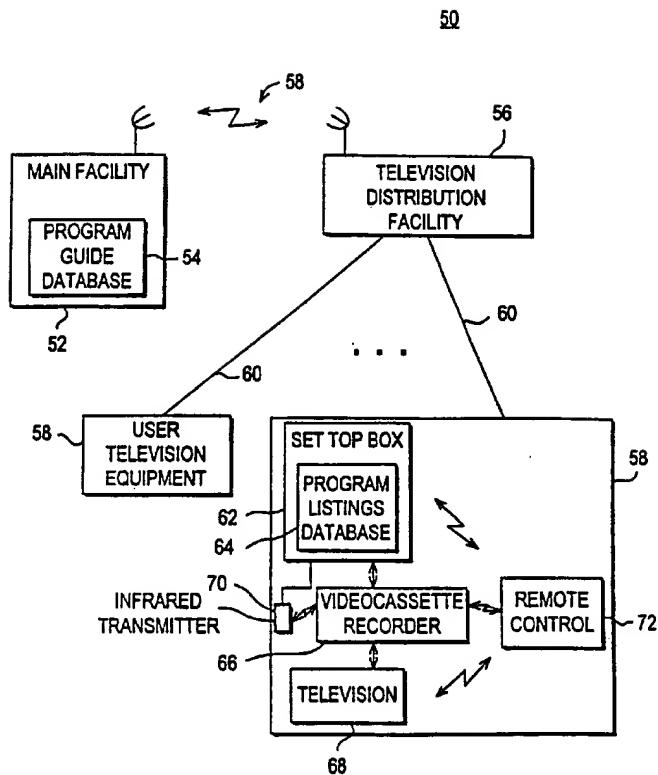


FIG. 1

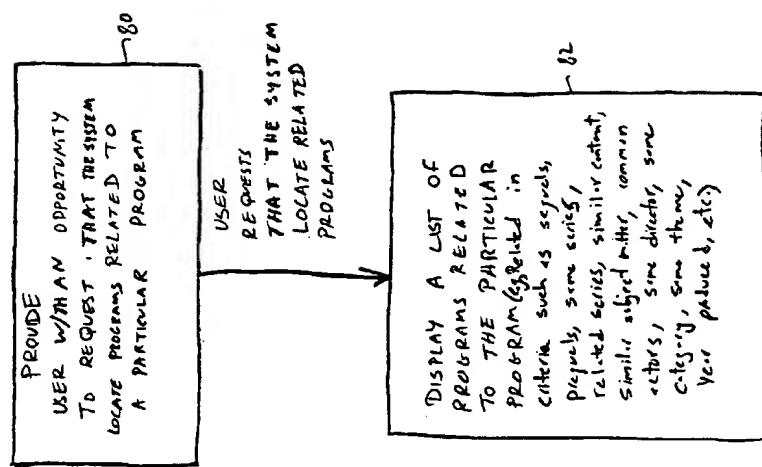


FIG. 2

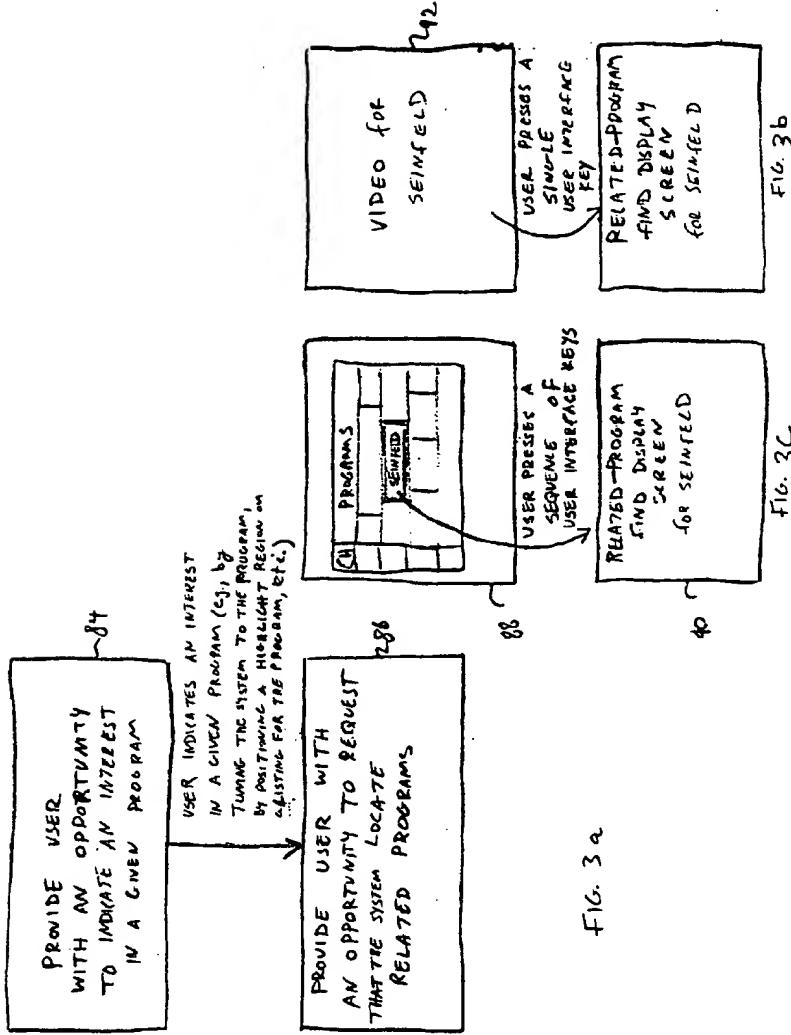
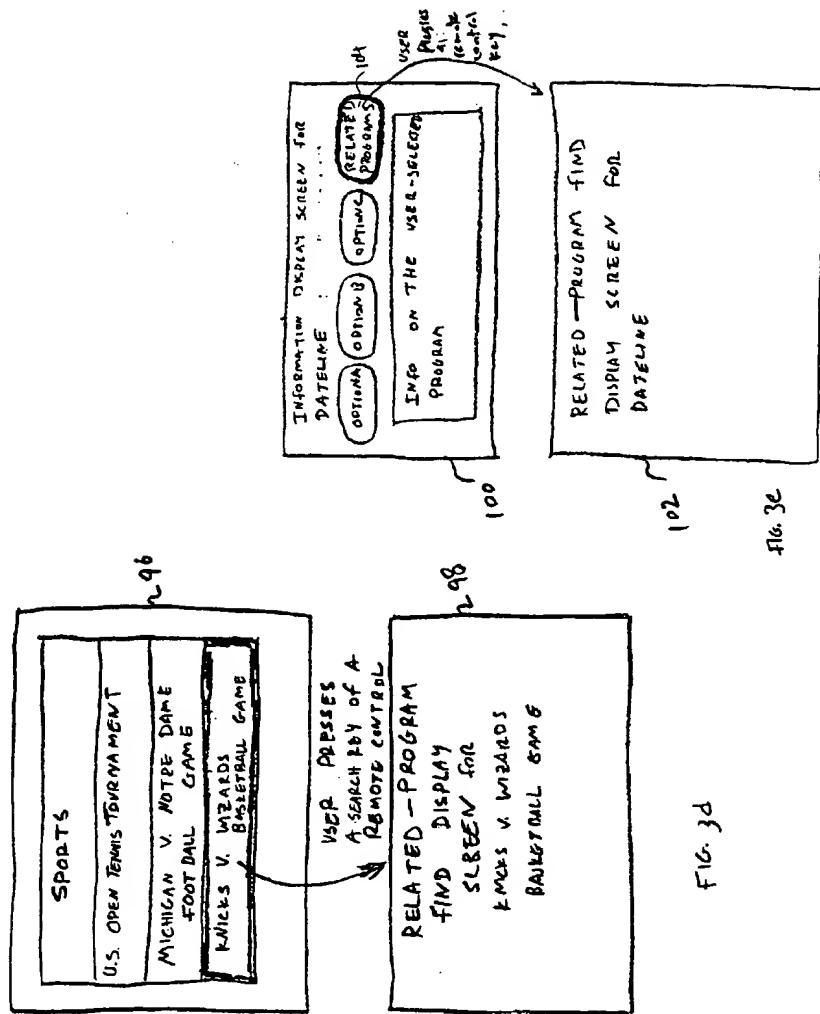


FIG. 3 a

FIG. 3 b

FIG. 3 c



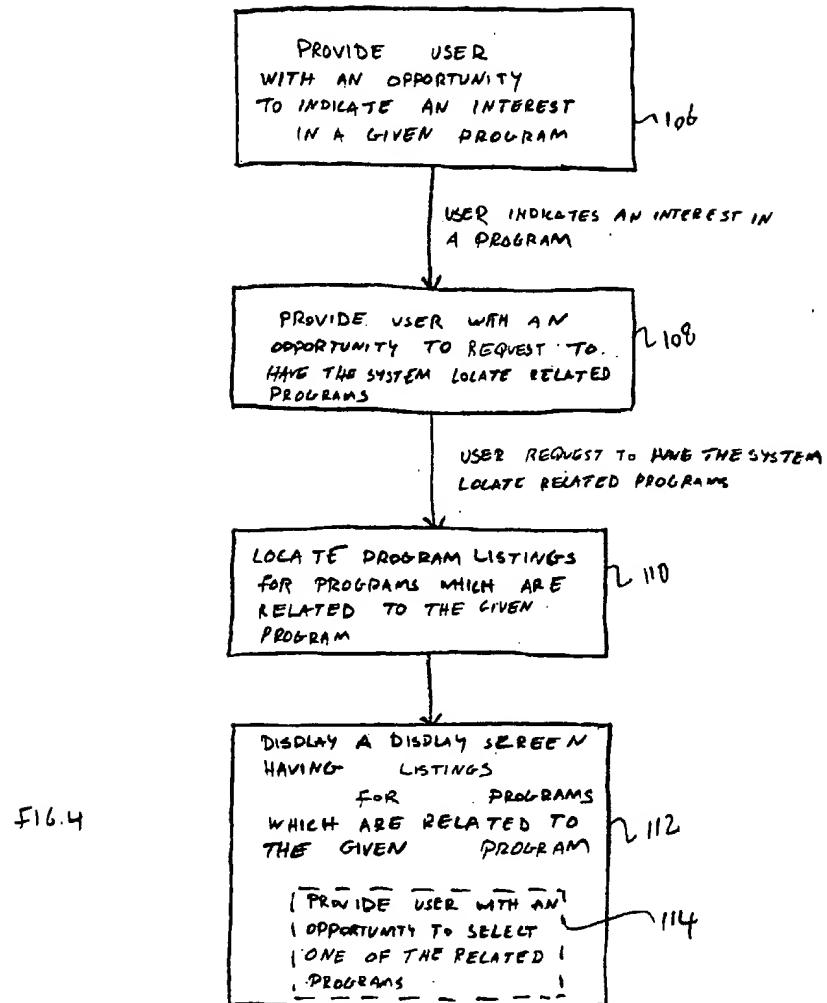
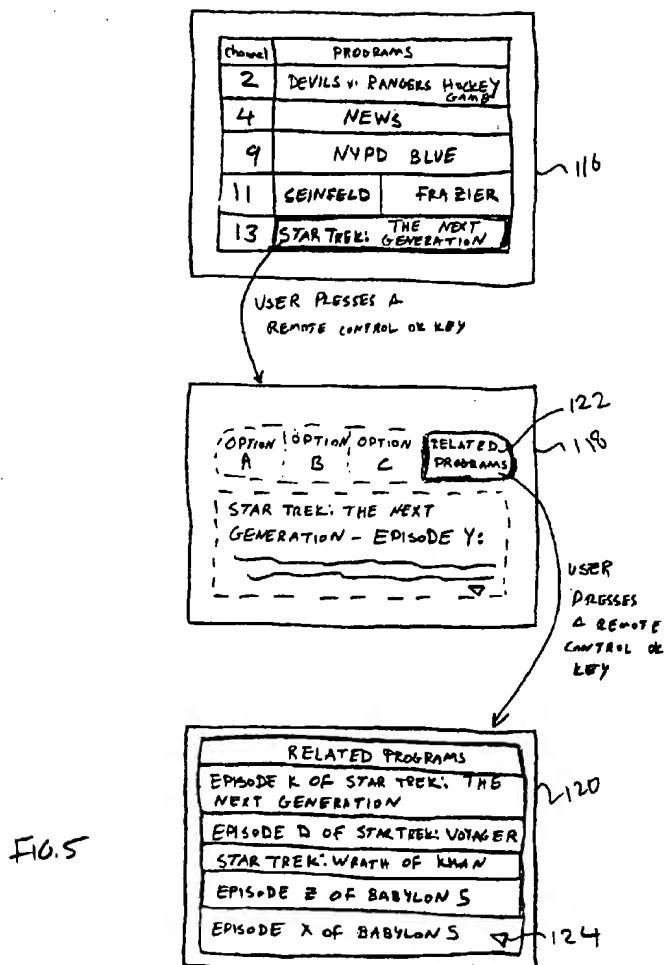
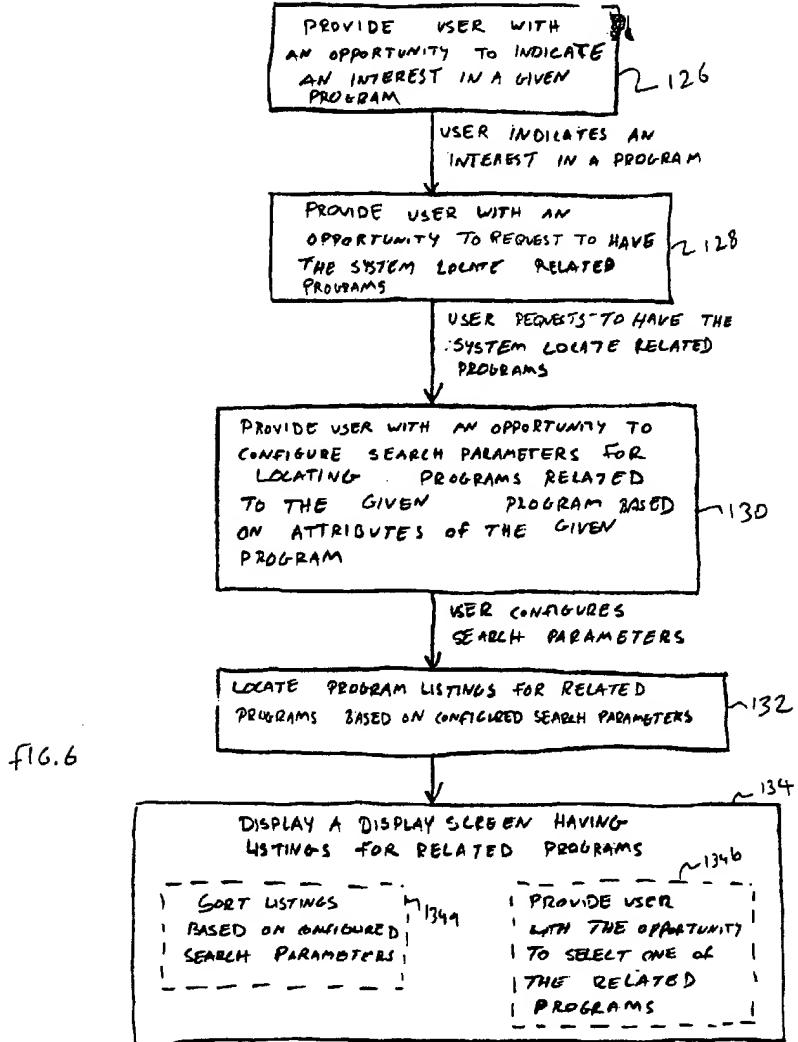


FIG.4





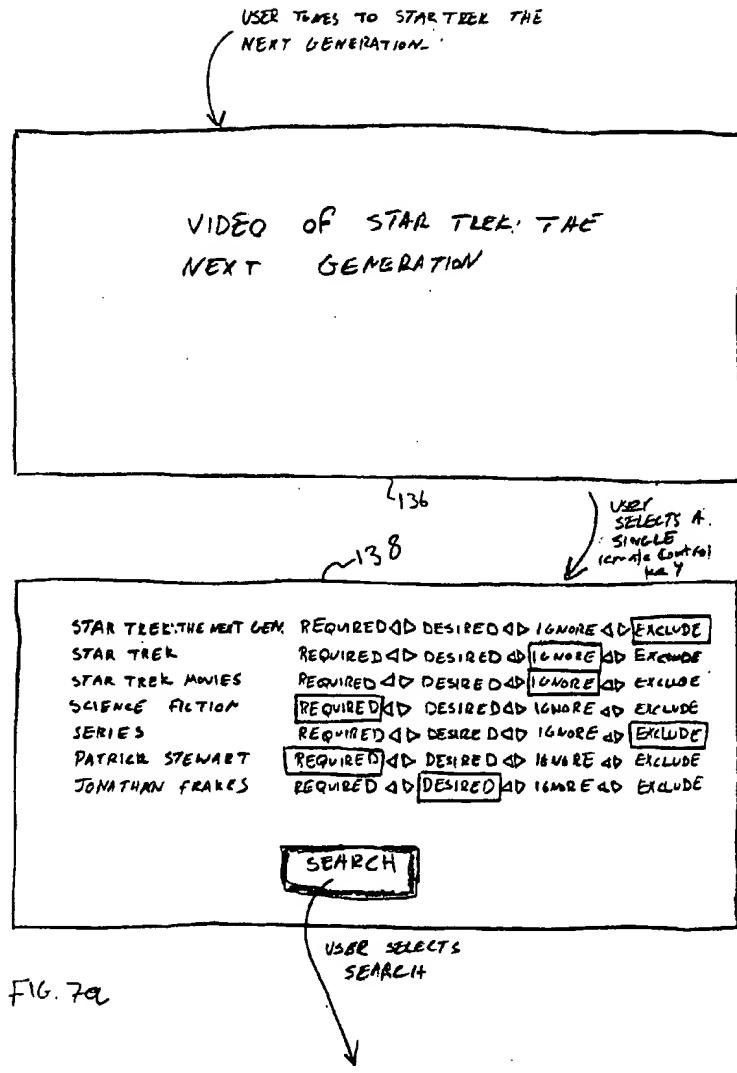


FIG. 7a

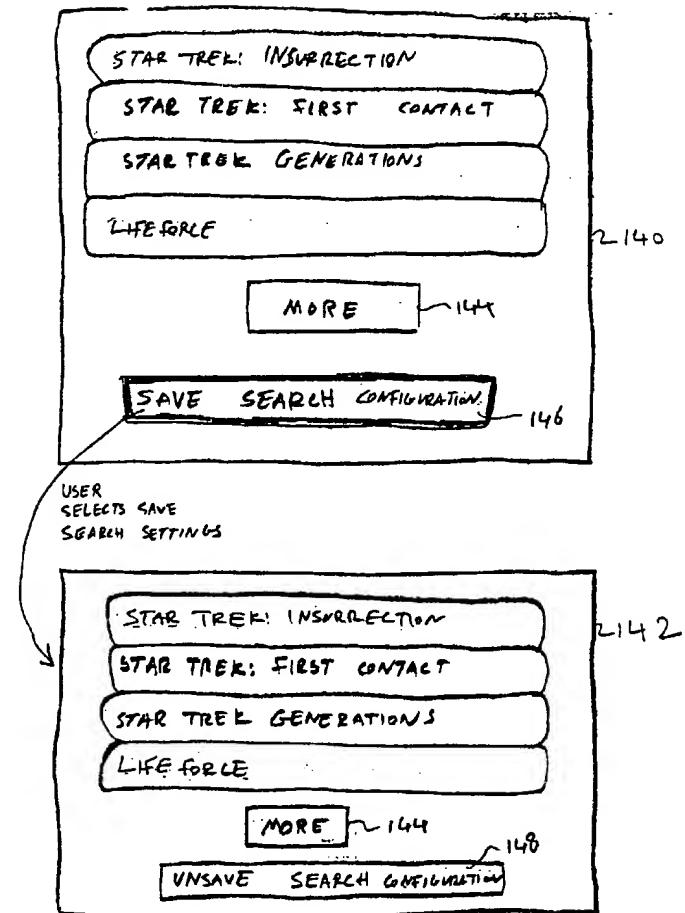


FIG. 7b

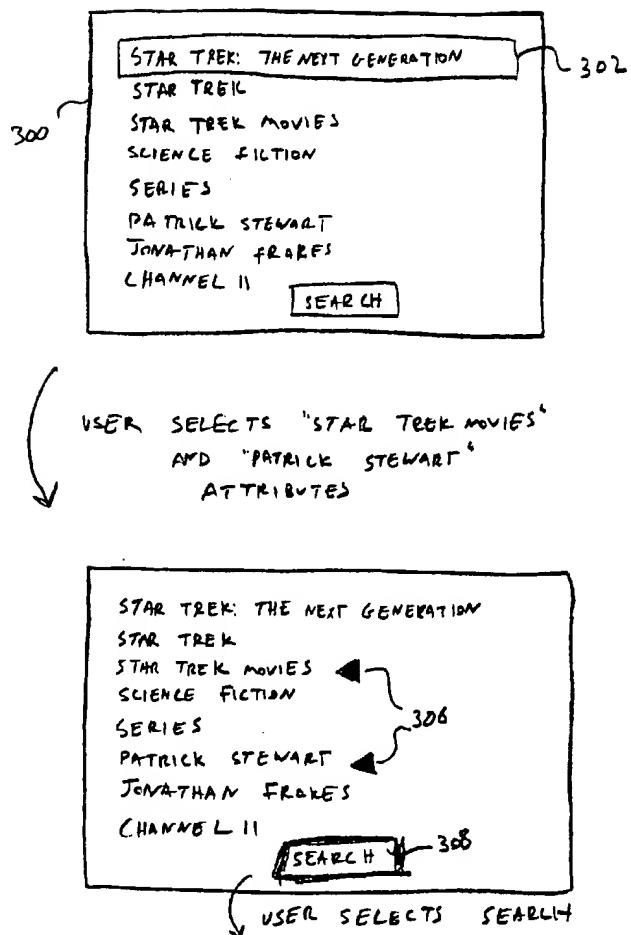


FIG. 7C

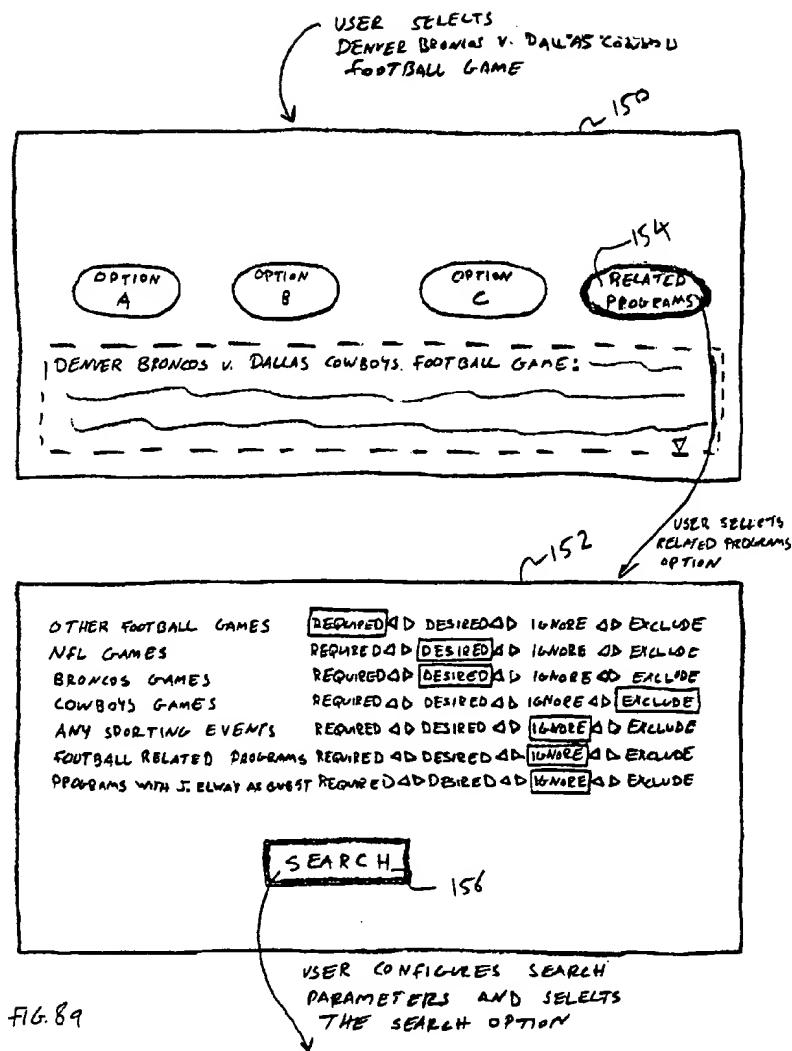


FIG. 89

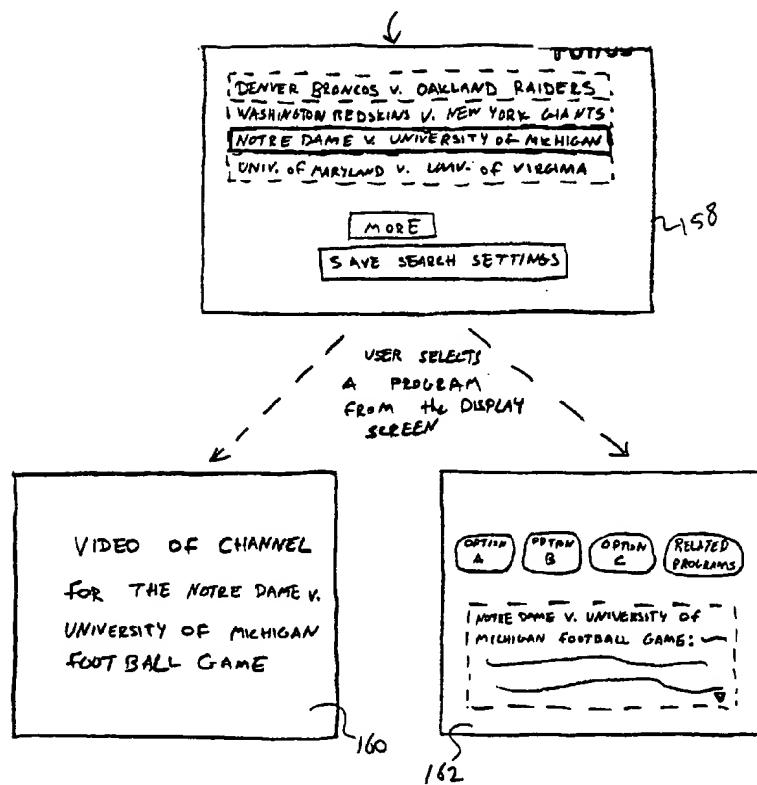
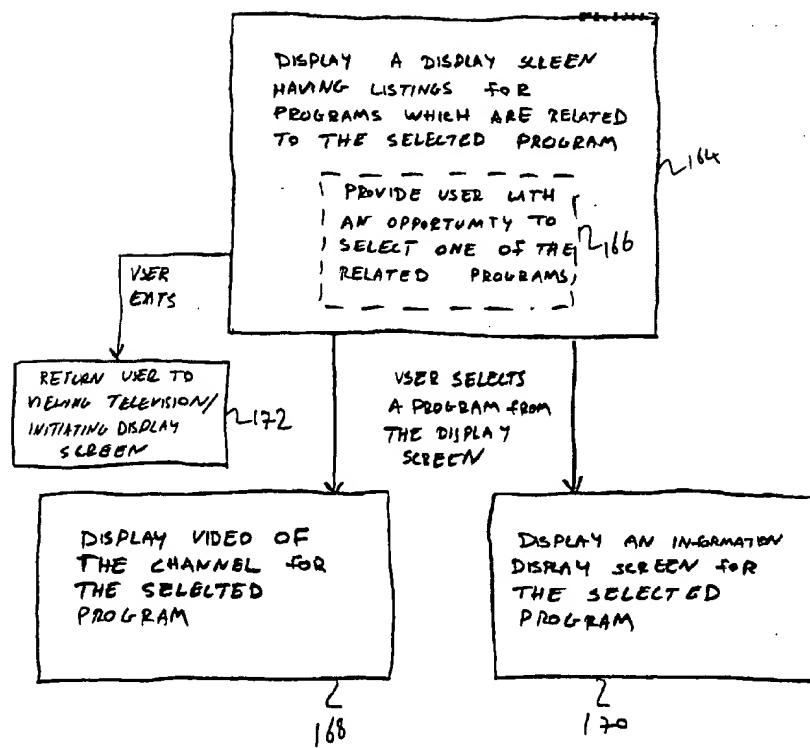
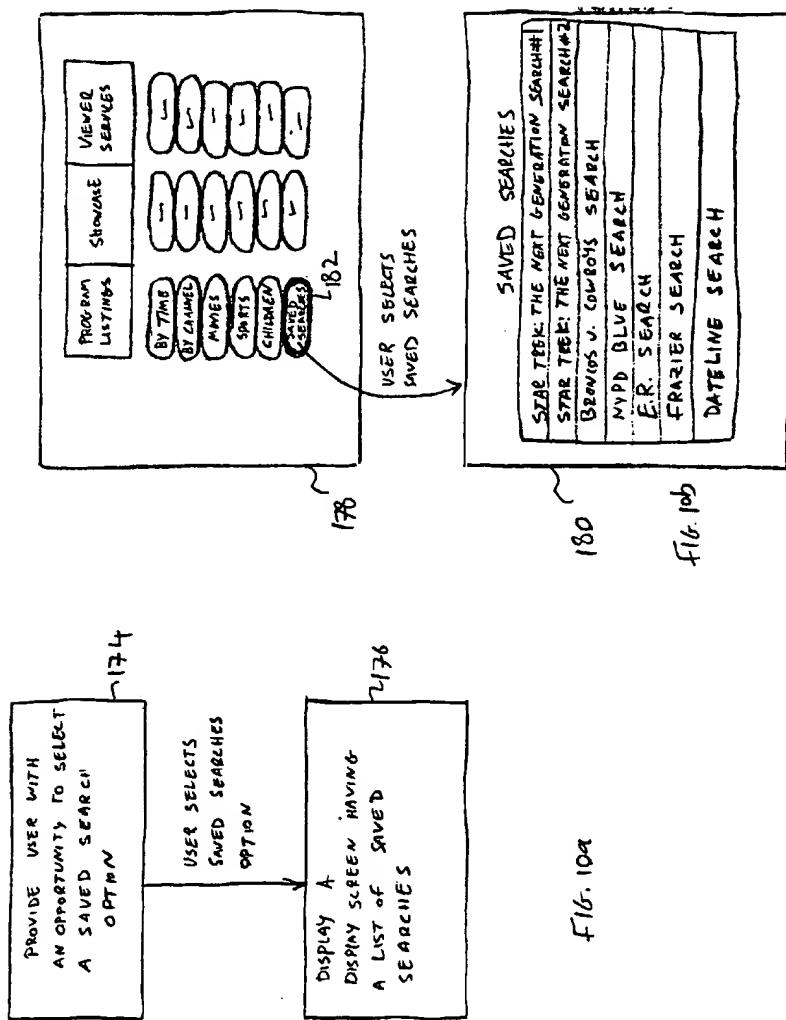
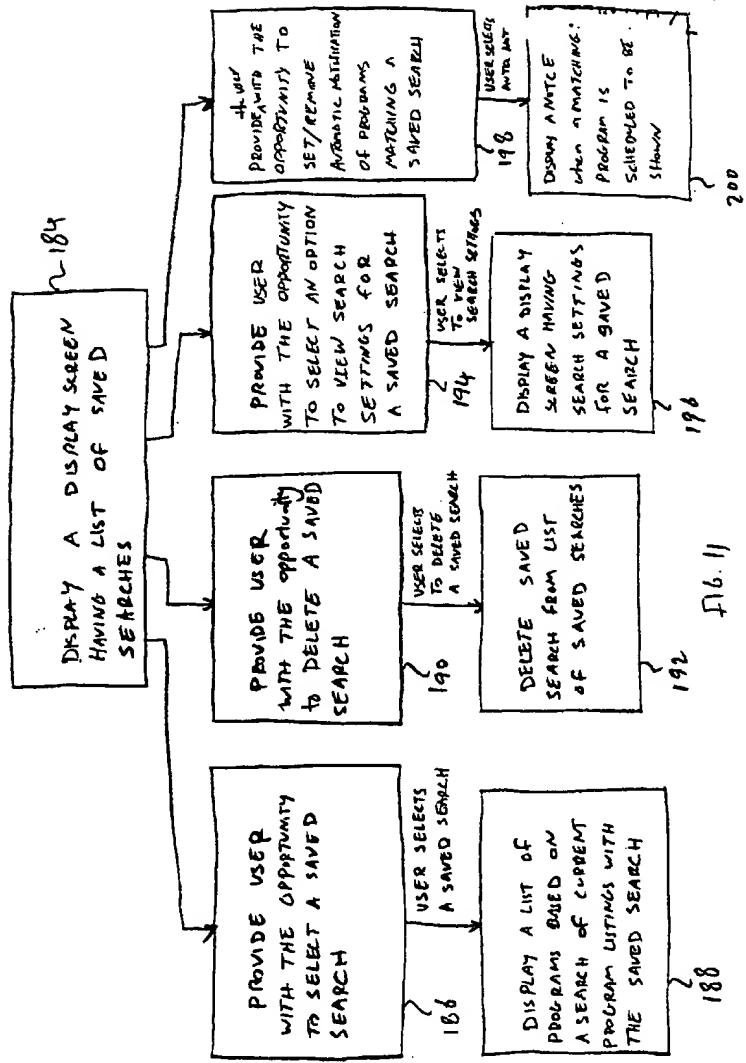


FIG. 8b







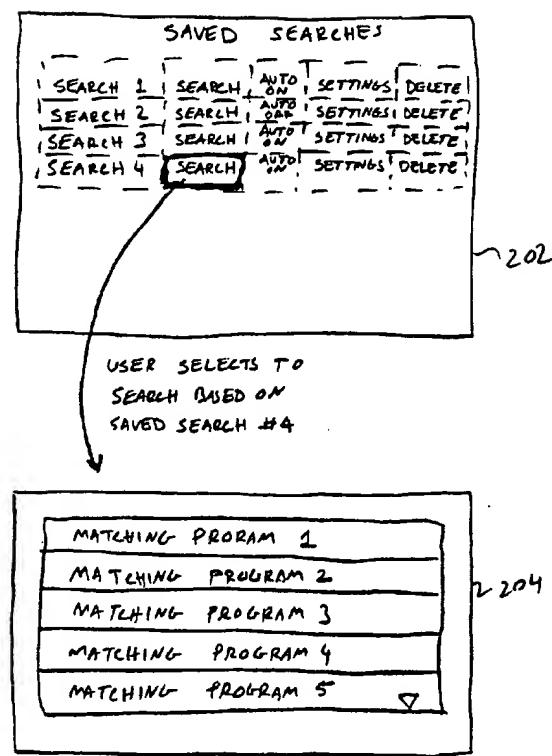


FIG. 12

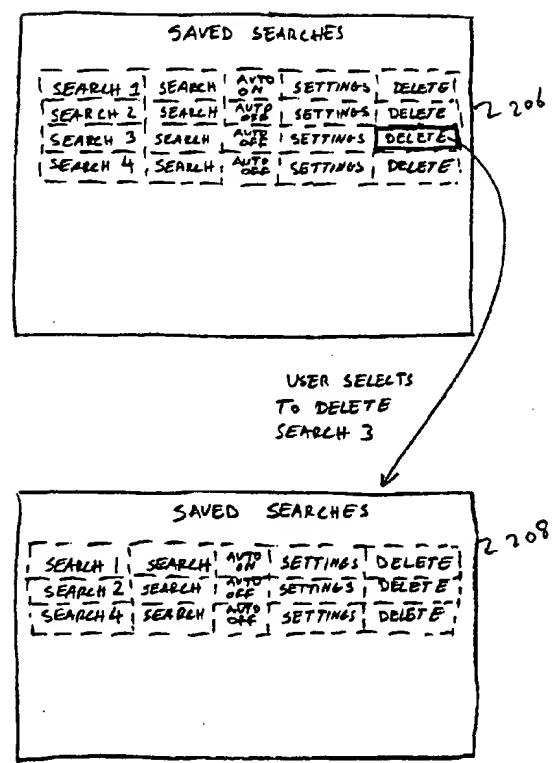
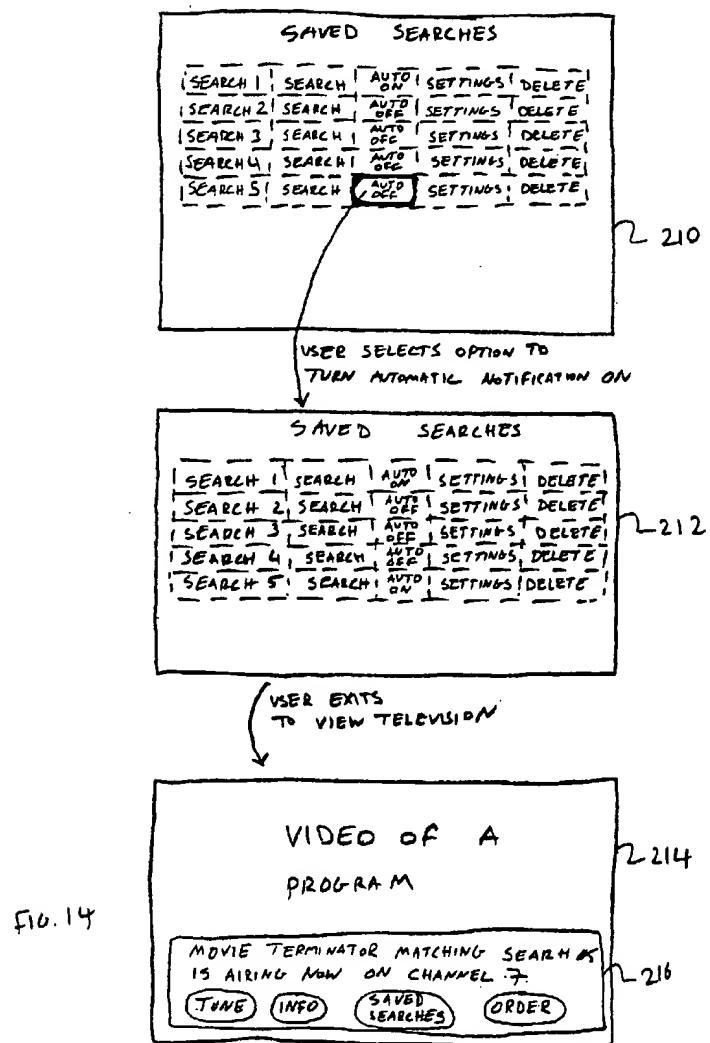


FIG. 13



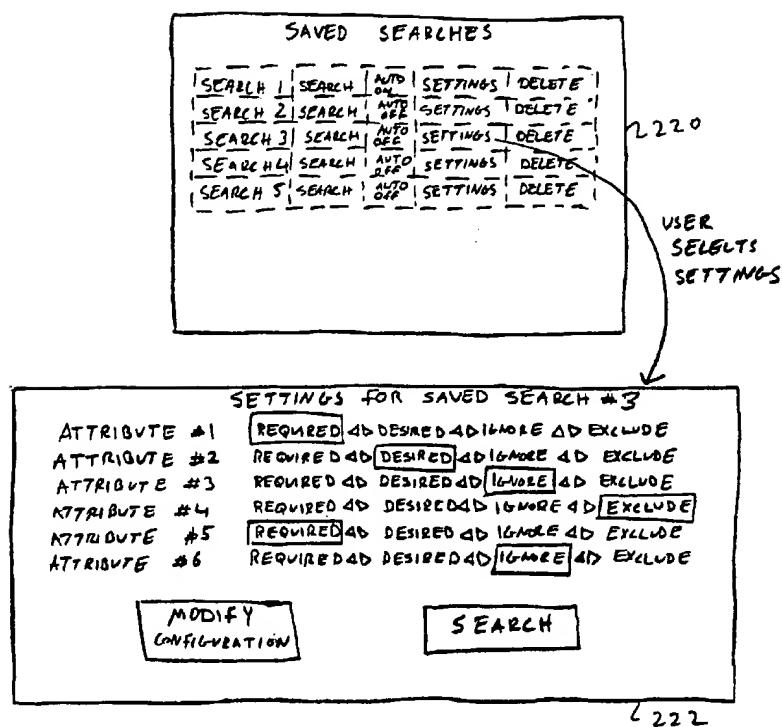


FIG. 15

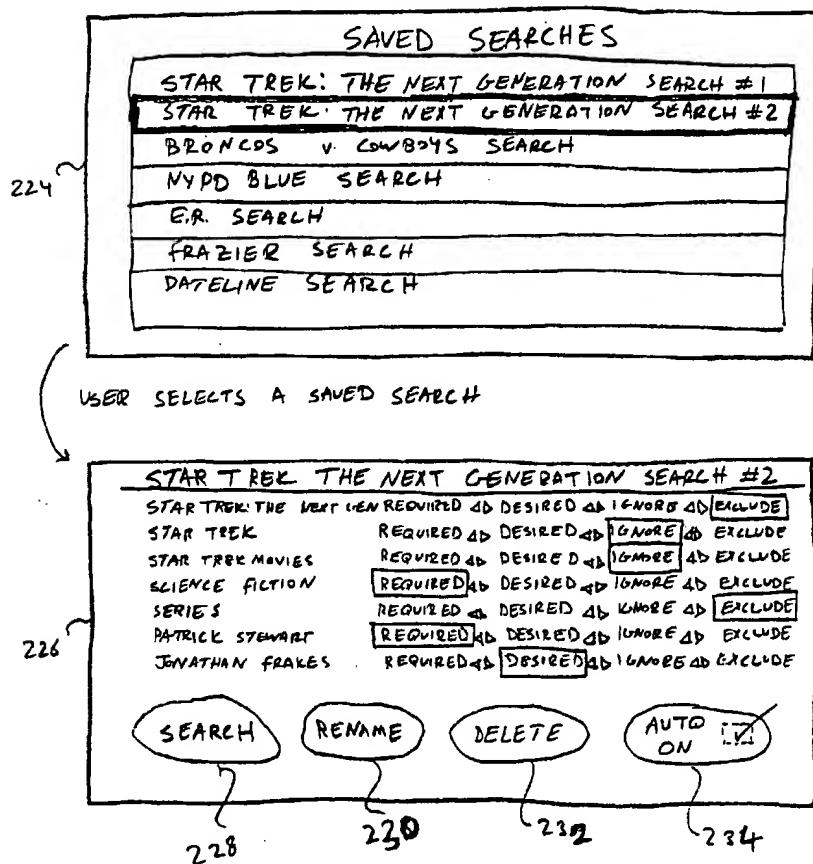


FIG 16

**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/US 99/28402

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 H04N5/445

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category | Citation of document, with indication, where appropriate, of the relevant passages                                          | Relevant to claim No. |
|----------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------|
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| A        | column 10, line 12 -column 19, line 33;<br>figures 3-5                                                                      | 7,9,11,<br>18,25,33   |
| X        | US 5 617 565 A (AUGENBRAUN JOSEPH E ET<br>AL) 1 April 1997 (1997-04-01)<br>column 5, line 62 -column 6, line 55;<br>claim 1 | 1,6                   |
| A        | —                                                                                                                           | 2-4,7-40              |
| X        | WO 97 48230 A (STARLIGHT TELECAST INC)<br>18 December 1997 (1997-12-18)<br>page 2, line 10 - line 11                        | 1,6                   |
| A        | —                                                                                                                           | 2-40                  |
| A        | page 15, line 34 -page 23, line 29; claims<br>1,2,15; figures 7-12                                                          | 11                    |
|          | —/—                                                                                                                         |                       |

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

\* Special categories of cited documents :

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Date of the actual completion of the International search

9 May 2000

Date of mailing of the International search report

16/05/2000

Name and mailing address of the ISA

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Authorized officer

Fuchs, P

## INTERNATIONAL SEARCH REPORT

International application No  
PCT/US 99/28402

| C(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT |                                                                                                                                                              |                           |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
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| A                                                   | column 6, line 48 -column 7, line 11;<br>figure 4                                                                                                            | 14,15,<br>21,22,<br>25,33 |
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| A                                                   | EP 0 774 866 A (THOMSON CONSUMER<br>ELECTRONICS) 21 May 1997 (1997-05-21)<br>column 1, line 1 - line 41<br>column 3, line 24 -column 5, line 27;<br>figure 4 | 11,18,<br>25,33           |
|                                                     | —                                                                                                                                                            |                           |

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

|                 |           |
|-----------------|-----------|
| International   | cation No |
| PCT/US 99/28402 |           |

| Patent document cited in search report |   | Publication date |  | Patent family member(s)                                      |  | Publication date                                     |
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| US 5617565                             | A | 01-04-1997       |  | US 5797001 A<br>US 5857181 A                                 |  | 18-08-1998<br>05-01-1999                             |
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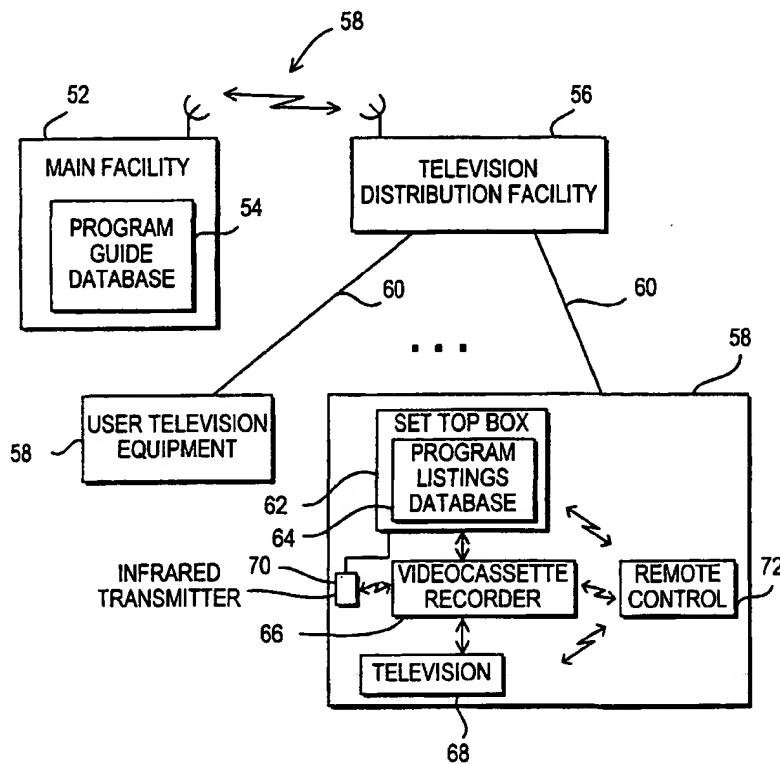
**(43) International Publication Date  
8 June 2000 (08.06.2000)**

(10) International Publication Number  
**WO 00/33573 A1**

|                                                         |                                                                                       |                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (51) International Patent Classification <sup>7</sup> : | H04N 5/445                                                                            | (72) Inventors: HERRINGTON, W., Benjamin; 725 W. 20th Street, Tulsa, OK 74107 (US). ELLIS, Michael, D.; 1300 Kingwood Place, Boulder, CO 80304 (US).                                                                                                                                                                                                       |
| (21) International Application Number:                  | PCT/US99/28402                                                                        |                                                                                                                                                                                                                                                                                                                                                            |
| (22) International Filing Date:                         | 30 November 1999 (30.11.1999)                                                         | (74) Agents: TREYZ, G., Victor et al.; Fish & Neave, 1251 Avenue of the Americas, New York, NY 10020 (US).                                                                                                                                                                                                                                                 |
| (25) Filing Language:                                   | English                                                                               | (81) Designated States (national): AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW. |
| (26) Publication Language:                              | English                                                                               |                                                                                                                                                                                                                                                                                                                                                            |
| (30) Priority Data:                                     | 60/110,989 3 December 1998 (03.12.1998) US                                            |                                                                                                                                                                                                                                                                                                                                                            |
| (71) Applicant:                                         | UNITED VIDEO PROPERTIES, INC. [US/US]; 7140 South Lewis Avenue, Tulsa, OK 74136 (US). | (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent                                                                                                                                                                                        |

[Continued on next page]

(54) Title: ELECTRONIC PROGRAM GUIDE WITH RELATED-PROGRAM SEARCH FEATURE



**(57) Abstract:** A system for searching for programs is provided. The system may be provide the user with an opportunity to indicate an interest in a given program. The system may provide the user with an opportunity to request that the system locate programs that are related to the given program in which the user has indicated an interest. The system may locate program listings that are related to the given program. The located program listings may be related to the given program based on attributes of the given program. The system may display a list of located listings and allow the user to select listings from the list. The system may tune to a program selected from the list, may display an information display screen for a program selected from the list, etc. The system may provide the user with an opportunity to configure and save search parameters. The system may sort related program listings based on the attributes of the given program. The system may provide the user with the opportunity to retrieve saved searches to locate currently available program listings and the



(AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

**(15) Information about Correction:**

see PCT Gazette No. 28/2001 of 12 July 2001, Section II

**Published:**

— *With international search report.*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**(48) Date of publication of this corrected version:**

12 July 2001

ELECTRONIC PROGRAM GUIDE WITH  
RELATED-PROGRAM SEARCH FEATURE

Background of the Invention

This invention relates to interactive television systems such as interactive television program guide systems, and more particularly, to techniques for program searching in these systems.

Cable, satellite, and broadcast television systems provide a large number of television channels. Typically, the number of channels provided by cable and satellite systems is over a hundred and ever increasing. Television viewers have traditionally consulted printed television program schedules to obtain programming information. More recently, interactive electronic television program guides have been developed to allow television program information to be displayed on viewer television equipment.

Interactive electronic television program guides ("program guides") typically provide program listings for all channels available in the television system. Some program guides include features for allowing users to search for programs. Such search

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features are often complex, time-consuming, and cumbersome. For example, such search features may require that a user select search parameters such as preferred programming genres before searching for 5 programs, that a user navigate through several display screens before being allowed to initiate a search, that the user enter at least a portion of a program title to initiate a search, etc.

It is therefore an object of the present 10 invention to provide a television system that includes an improved program searching feature.

Summary of the Invention

These and other objects of the invention are accomplished in accordance with the principles of the 15 present invention by providing a system for searching for programs. The system may provide the user with an opportunity to indicate an interest in a given program. The system may provide the user with an opportunity to request that the system locate programs that are 20 related to the given program in which the user indicated an interest. The system may locate program listings that are related to the given program. The located program listings may be related to the given program based on attributes of the given program.

25 The system may display a list of the located program listings. The system may provide the user with an opportunity to select from the list of related programs. The system may tune to a program selected from the list, may display an information display 30 screen for a program selected from the list, etc.

The system may provide the user with an opportunity to configure search parameters. For example, The system may present the user with a list of

- 3 -

attributes for the given program and may allow the user to select one or more attributes and may allow the user to select which logical operations (e.g., and/or operations) are to be performed on the attributes. The 5 system may search television program listings and may display a list of related programs based on the selected attributes.

The system may sort related program listings based on the attributes of the given program. The 10 system may provide the user with an opportunity to save search parameters for use at a later time. The system may display a list of previously saved searches and may provide the user with an opportunity to direct the system to locate currently available program listings 15 based on a saved search from the list. The system may locate currently available listings based on the user-selected search parameters from the saved search when the saved search is retrieved. The system may allow the user to delete a saved search. The system may 20 automatically display a notification based on user-selected search parameters from a saved search. The system may provide the user with an opportunity to view the user-selected search parameters for a saved search.

Further features of the invention, its nature 25 and various advantages will be more apparent from the accompanying drawings and the following detailed description of the preferred embodiments.

#### Brief Description of the Drawings

FIG. 1 is a diagram of an illustrative 30 interactive television program guide system in accordance with the present invention.

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FIG. 2 is a flow chart of illustrative steps involved in providing program searching in accordance with the present invention.

FIG. 3a is a flow chart of illustrative steps 5 involved in providing an opportunity to request that the system locate programs related to a given program in accordance with the present invention.

FIG. 3b is a diagram of an illustrative sequence of illustrative display screens for providing 10 an opportunity to request that the system locate programs that are related to a given program in accordance with the present invention.

FIG. 3c is a diagram of an illustrative sequence of illustrative display screens for providing 15 an opportunity to request that the system locate programs that are related to a given program in accordance with the present invention.

FIG. 3d is a diagram of an illustrative sequence of illustrative display screens for providing 20 an opportunity to request that the system locate programs that are related to a given program in accordance with the present invention.

FIG. 3e is a diagram of an illustrative sequence of illustrative display screens for providing 25 an opportunity to request that the system locate programs that are related to a given program in accordance with the present invention.

FIG. 4 is a flow chart of illustrative steps involved in displaying program listings that are 30 related to a given program in accordance with the present invention.

FIG. 5 is a diagram of an illustrative sequence of illustrative display screens for displaying

- 5 -

program listings that are related to a given program in accordance with the present invention.

FIG. 6 is a flow chart of illustrative steps involved in displaying program listings that are 5 related to a given program based on user-selected search parameters in accordance with the present invention.

FIG. 7a is a diagram of an illustrative sequence of illustrative display screens for searching 10 for program listing that are related to a given program based on user-selected search parameters in accordance with the present invention.

FIG. 7b is a diagram of an illustrative sequence of illustrative display screens for displaying 15 program listings that are related to a given program based on user-selected search parameters in accordance with the present invention.

FIG. 7c is a diagram of an illustrative sequence of illustrative display screens for searching 20 for program listings that are related to a given program based on user-selected search parameters in accordance with the present invention.

FIG. 8a is a diagram of an illustrative sequence of illustrative display screens for searching 25 for program listings that are related to a given program based on user-selected search parameters in accordance with the present invention.

FIG. 8b is a diagram of an illustrative sequence of illustrative display screens for selecting 30 a program listing that is related to a user-selected program in accordance with the present invention.

FIG. 9 is a flow chart of illustrative steps involved in providing display screens when a user makes

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selections from a related-program find display screen in accordance with the present invention.

FIG. 10a is a flow of illustrative steps involved in displaying a display screen having a list 5 of saved searches in accordance with the present invention.

FIG. 10b is a diagram of an illustrative sequence of illustrative display screens for providing a display screen having a list of saved searches in 10 accordance with the present invention.

FIG. 11 is flow chart of illustrative steps involved in providing saved search features in accordance with the present invention.

FIG. 12 is a diagram of an illustrative sequence of illustrative display screens for searching 15 for program listings based on a saved search in accordance with the present invention.

FIG. 13 is a diagram of an illustrative sequence of illustrative display screens for deleting a 20 saved search in accordance with the present invention.

FIG. 14 is a diagram of an illustrative sequence of illustrative display screens for providing an automatic notification of a program matching a saved search in accordance with the present invention.

FIG. 15 is a diagram of an illustrative sequence of illustrative display screens for displaying 25 search parameters for a saved search in accordance with the present invention.

FIG. 16 is a diagram of an illustrative sequence of illustrative display screens for providing 30 save search features in accordance with the present invention.

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Detailed Description of the Preferred Embodiments

An illustrative interactive television program guide system 50 in accordance with the present invention is shown in FIG. 1. Main facility 52 5 includes a program guide database 54 for storing program guide information (e.g., television program listings data, program-related information, service listings data, service-related information, pay-per-view ordering information, television program 10 promotional information, etc.).

Main facility 52 preferably includes a processor to handle information distribution tasks. Information from database 54 may be transmitted in parallel via communications links such as 15 communications link 58 to multiple television distribution facilities such as television distribution facility 56. Only one television distribution facility is shown in FIG. 1 to avoid over complicating the drawings. Each communications link 58 may be a 20 satellite link, a telephone network link, a combination of such links, or another suitable communications path. Text, graphics, and video data signals may be transmitted over link 58. If it is desired to transmit video signals over communications link 58, a relatively 25 high bandwidth link such as a satellite link is generally preferable to a relatively low bandwidth link such as a telephone line.

Television distribution facility 56 is a facility such as a cable system headed, a broadcast 30 distribution facility, or a satellite television distribution facility for distributing television signals to viewers.

The program guide information transmitted by main facility 52 to television distribution facility 56

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includes television program listings data such as program times, channels, titles, descriptions, program type, genre, actors, etc. Transmitted program guide information may include pay program data such as 5 pricing information for individual programs and subscription channels, time windows for ordering programs and channels, telephone numbers for placing orders that cannot be impulse ordered, etc.

Television distribution facility 56 may 10 distribute program guide information received from main facility 52 to user television equipment 58 via communications paths 60. User television equipment 58 may be any suitable equipment for providing television that contains sufficient processing capabilities to 15 monitor viewing activities, analyze these activities and display appropriate program listings information for the user.

Communications paths 60 may be cable links, fiber optic links, satellite links, broadcast links, or 20 other suitable link, or a combination of such links. Any suitable communications scheme may be used to transmit data over paths 60, including in-band transmissions, out-of-band transmissions, digital transmissions, analog transmissions, cable 25 transmissions, satellite transmissions, over-the-air transmissions, multichannel multipoint distribution services (MMDS) transmissions, etc.

Communications paths 60 preferably have sufficient bandwidth to allow television distribution 30 facility 56 to distribute television programming, program listings information, advertisements, and other information to user television equipment 58. Multiple television and audio channels (analog, digital, or both analog and digital) may be provided to user television

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equipment 58 via communication paths 60. If desired, some of the data may be distributed to user television equipment 58 by one or more distribution facilities that are separate from television distribution facility 5 56 using communication paths that are at least partly separate from communication paths 60.

The data distribution technique that is used to distribute data on paths 60 may depend on the type of information that is being distributed. For example, 10 text and graphics may be distributed over an out-of-band channel using an out-of-band modulator or distributed in the vertical blanking interval lines of an analog video channel. Video information may also be distributed in this way, although large quantities of 15 video information may be more efficiently distributed using one or more digital channels or streams on paths 60. Such digital channels or streams may also be used for distributing text and graphics.

Each user television equipment device 58 has 20 a receiver which is typically a set-top box such as set-top box 62. The receiver may also be other suitable television equipment such as an advanced television receiver into which circuitry similar to set-top-box circuitry has been integrated or a personal 25 computer television (PC/TV). For illustrative purposes, the present invention will be described in the context of user television equipment 58 that uses set-top boxes.

Each set-top box 62 is typically connected to 30 an optional videocassette recorder 66 so that selected television programs may be recorded. Videocassette recorder 66 is typically connected to a television 68. To record a program, set-top box 62 tunes to a particular channel and sends control signals to

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videocassette recorder 66 (e.g., using infrared transmitter 70) that instructs videocassette recorder 66 to start and stop recording at the appropriate times.

5           Television program listings, advertisements, programming information, and other information may be displayed on television 68. Each set-top box 62, videocassette recorder 66, and television 68 can be controlled by one or more remote controls 70 or any 10 other suitable user input interface, such as a wireless keyboard, mouse, trackball, dedicated set of buttons, touch screen display remote, etc. Remote controls, such as remote control 70, have various buttons that can be pressed by the user such as arrow keys (e.g., 15 for directing on-screen movement of a highlight region, for directing scrolling functions, etc.), an OK, select, enter, or other such selection key for making a selection (hereinafter referred to as an OK key), channel number keys (for selecting a television 20 channel), a favorites key (to invoke functions related to user preferences), a delete key (to delete menu items or to express a disinterest in certain user preferences), an information key for receiving information on a program (hereinafter referred to as an 25 INFO key), a specific feature key (e.g., a related-program search key to invoke program searching), etc. For illustrative purposes, many aspects of the present are discussed primarily in the context of a user interface being a remote control.

30           Certain program guide features, such as pay program purchasing, the purchasing of products or services, and data collection functions, may require that user television equipment 58 transmit data to television distribution facility 56 over communications

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paths 60. If desired, such data may be transmitted over telephone lines or other separate communications paths. If features such as these are provided using facilities separate from television distribution

5 facility 56, some of the communications involving user television equipment 58 may be made directly with the separate facility (not shown).

If desired, an interactive television program guide system may be implemented using a data-relay

10 architecture. In such an architecture, television distribution facility 56 may serve as a data relay site and user television equipment 58 may be a data destination site. For example, as television distribution facility 56 receives information from main

15 facility 52, television distribution facility 56 may continuously or periodically distribute information to user television equipment 58. In a data-relay architecture, a program guide implemented on user television equipment 58 may use a database (e.g.,

20 database 64) for storing program guide information at user television equipment. Program guide information may include program listings and program attributes. Program attributes may be information such as program title, program actors, program duration, program genre

25 (e.g., sports, comedy, movies, etc.), program channel, scheduled program duration, program rating (e.g., TV-G, PG-13, etc.), program content rating (or critics' rating or star rating, e.g., one star, two stars, etc.) and other related parameters that can be tagged to a

30 program. Television distribution facility 56 may also poll set-top boxes periodically for certain information (e.g., pay program account information or information regarding programs that have been purchased and viewed using locally-generated authorization techniques).

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The features of the present invention may be implemented in a client-server arrangement or in a combination client-server and data-relay arrangement. In such arrangements, the server (e.g., television 5 distribution facility 56) may include a database that may include program listing information.

For clarity, the present invention is sometimes described primarily in the context of program guides that are implemented on user television 10 equipment rather than in the context of program guides that are implemented partially on a server and partially on user television equipment or a more fully server-based architecture.

Each set-top box 62 preferably contains a 15 processor to handle tasks associated with implementing an application on the set-top box 62 that assists the user in searching for programs. For example, a stand-alone application may be provided that supports program searching, as described more fully below. If desired, 20 these tasks may be implemented using a program guide application. For clarity, the present invention will be described primarily in the context of such a program guide application and in the context of a program guide system.

25 Illustrative steps involved in providing program searching in an interactive television system such as interactive television program guide system 50 of FIG. 1 are shown in FIG. 2. Initially at step 80, the program guide may provide a user with an 30 opportunity to request that the system locate programs that are related to a particular program (e.g., a program in which the user has indicated an interest using the system). The program guide may, at step 82, display a list of programs that are related to the

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particular program when the user requests that the system locate programs that are related to the particular program. The program guide may include programs in the list based on criteria, such as whether 5 a program is related in attribute to the particular program, whether a program is a sequel or prequel of the particular program, whether a program is in the same program series as the particular program, whether a program is a series that is related to the particular 10 program, whether a program is related the user-selected program in content or subject matter, whether a program has the same actor(s), director, category, theme, or production year as the user-selected program, etc.

Illustrative steps involved in providing a 15 user with an opportunity to request that a system locate programs related to a given program in an interactive television system such as interactive television program guide system 50 of FIG. 1 are shown in FIG. 3a. At step 84, the program guide may provide 20 a user with an opportunity to indicate an interest in a given program. The user may indicate an interest in the given program by, for example, positioning a highlight region on a program listing for the given program, tuning the system to the given program, 25 selecting that an information display screen for the given program be displayed, etc. At step 86, the program guide may provide the user with an opportunity to request that the system locate programs that are related to the given program.

30 Illustrative display screens of FIG. 3b, FIG. 3c, FIG. 3d, and FIG. 3e may be provided based on the illustrative steps of FIG. 3a. As shown in FIG. 3b, the program guide may display related program find display screen 94 for the program Seinfeld when a user

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presses a single user interface key while a video for Seinfeld is displayed in display screen 92. The single user interface key may, for example, be a search key of a remote control for requesting that the system locate 5 related programs.

If desired, as shown in FIG. 3c, the program guide may display related-program find display screen 90 for the program Seinfeld when the user presses a predetermined sequence of user interface keys after 10 navigating a highlight region on a listing for Seinfeld in program listings display screen 88. The predetermined sequence of user interface keys may, for example, be pressing a search key and an OK key of a remote control.

15 A sequence of keys may be used when the user interface device (e.g., a remote control) does not have a key dedicated to providing the user with an opportunity to request that the system locate related programs.

20 If desired, as shown in FIG. 3d, the program guide may display related-program find display screen 98 for the Knicks v. Wizards basketball game when the user presses a search key of a remote control after 25 navigating a highlight region on the listing for the Knicks v. Wizards basketball game in sports category program listings display screen 96.

If desired, as shown in FIG. 3e, the program guide may display related-program find display screen 102 for Dateline when a user presses a remote control 30 OK key after navigating a highlight region on related programs option 104 of information display screen 100 for Dateline. The program guide may have displayed information display screen 100 for Dateline when, for example, the user pressed an OK key of a remote control

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after navigating a highlight region on a Dateline program listing, the user pressed an INFO key when video for Dateline is being displayed, etc. Examples of program guide systems with information display screen 5 capabilities are provided in Rudnick et al., U.S. Patent Application Serial No. 09/356,268 filed July 16, 1999, which is hereby incorporated by reference herein in its entirety.

Illustrative steps involved in displaying 10 program listings that are related to a given program in an interactive television system such as interactive television program guide system 50 of FIG. 1 are shown in FIG. 4. At step 106, the program guide may provide the user with an opportunity to indicate an interest in 15 a given program. At step 108, when the user indicates an interest in the given program, the program guide may provide the user with an opportunity to request that the system locate programs that are related to the given program.

At step 110, the program guide may locate 20 program listings (e.g., program listings stored in a program guide database, such as database 64 of FIG. 1) that are related to the given program. The program guide may locate program listings based on attributes 25 of the given program. For example, the program guide may locate program listings for programs that have an attribute that matches an attribute of the given program (e.g., a common actor, same content, same subject matter, same series, common director, same category, same theme, common production year, etc.), program listings for programs that have a plurality of attributes matching attributes of the given program, program listings for programs that have attributes that are related to the attributes of the given program 30

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(e.g., prequels, sequels, similar content, similar subject matter, related series, etc.), etc.

At step 112, the program guide may display a display screen (or, if desired, an overlay) having 5 listings for programs which are related to the user-selected program. From the list, the user may find a particular program of interest to the user. The program guide may provide the user with an opportunity to select a program listing from the list at step 114.

10 Illustrative program listings display screen 116, illustrative information display screen 118, and illustrative related-program find display screen 120 of FIG. 5 may be provided based on the illustrative steps of FIG. 4. The program guide may display information 15 display screen 118 for Star Trek: The Next Generation - Episode Y when a user selects a listing for Star Trek: The Next Generation - Episode Y in program listings display screen 116 (e.g., by pressing an INFO key when a highlight region is positioned on that listing).  
20 Information display screen 118 may include a related programs options 122 for requesting to find programs related to Star Trek: The Next Generation - Episode Y.

The program guide may display related program find display screen 120 when a user selects the related 25 programs option 122 from information display screen 118. Related-program find display screen 120 includes a list of programs related to Star Trek: The Next Generation - Episode Y that contains: Episode K of Star Trek: The Next Generation, Episode D of Star Trek: Voyager, Star Trek: Wrath of Khan, Episode Z of Babylon 5, Episode X of Babylon 5, etc. The list may have been sorted based on attributes that were used by the program guide to locate the displayed program listings. For example, the list may have been sorted based on

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which attribute caused the match, or for example, based on how many attributes matched. Related-program find display screen 120 may include an indicator, such as arrow 124, to inform the user that the list may be 5 scrolled to display further listings for related programs that are not currently displayed. Such an indicator may be used when there is insufficient space for displaying all the related programs in a related program find display screen.

10 Illustrative steps involved in displaying program listings that are related to a given program based on user-configured search parameters in an interactive television system such as interactive television program guide system 50 of FIG. 1 are shown 15 in FIG. 6. Steps 126 and 128 are the same as steps 106 and 108 of FIG. 4, respectively, and are discussed above. At step 130 of FIG. 6, when the user requests that the system locate programs that are related to a given program, the program guide may provide the user 20 with an opportunity to configure search parameters for searching for related programs based on attributes of the user-selected program. At step 132, the program guide may then locate program listings based on the user-configured search parameters. The program guide 25 may locate program listings from program listings stored in a database, such as program listings database 64 FIG. 1. The location of the program listings database may depend on the communications arrangement of the interactive television program guide system 30 (e.g., in a client-server arrangement at least part of the database may be located at a television distribution facility). At step 134, the program guide may display a display screen including on-screen listings for programs that are related to the given

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program based on the user-configured search parameters. At step 134a, the program guide may sort the located listings for display based on the user-configured search parameters. At step 134b, the program guide may 5 provide the user with an opportunity to select one of the displayed programs listings.

Illustrative display screen 136 and illustrative related-program find search configuration display screen 138 (hereinafter, configuration display 10 screen 138) of FIG. 7a may be provided based on the illustrative steps of FIG. 6. The program guide may display configuration display screen 138 for an episode of Star Trek: The Next Generation when a user presses a single key of a remote control while a video for that 15 episode of Star Trek: The Next Generation is being displayed. Configuration display screen 138 may contain an on-screen list of attributes for the given program, Star Trek: The Next Generation. The configuration display screen 138 may contain options 20 for providing the user with an opportunity to assign various importance levels to the on-screen program attributes. The option may provide the user with an opportunity to assign different importance levels such as required, desired, ignored, or excluded to the 25 program attributes.

Configuration display screen 138 shows that importance levels may be assigned to the program attributes for the given episode of Star Trek: The Next Generation so that when locating related program 30 listings, the program guide excludes programs that are Star Trek: The Next Generation, ignores whether a program is a Star Trek program when deciding whether it matches, ignores whether a program is a Star Trek movie when deciding whether it matches, requires matching

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programs to be science fiction, requires matching programs to have Patrick Stewart. Configuration display screen 138 may include a search option that may provide the user with an opportunity to direct the 5 program guide system to locate program listings related to the given program based on the program attributes and their assigned importance levels.

Illustrative related-program find display screens 140 and 142 of FIG. 7b may be provided based on 10 the illustrative steps of FIG. 6. The program guide may display related-program find display screen 140 when, for example, the user selects the search option from configuration display screen 138 of FIG. 7a.

Display screen 140 may include a list of programs that 15 are related to the given program based on the search parameters of configuration display screen 138 of FIG. 7a. The list of related programs in display screen 140 includes the program Lifeforce, which is a science fiction program (a required attribute) starring Patrick 20 Stewart (a required attribute), and includes three Star Trek movies (Insurrection, First Contact, and Generations) that are also science fiction programs starring Patrick Stewart and also starring Jonathan Frakes (a desired attribute). Lifeforce may be 25 displayed at the bottom of the list because the other programs more closely match the user-configured search parameters.

Display screen 140 may include option 144 for displaying more program listings that are related to 30 Star-Trek: The Next Generation based on the user-configured search parameters. Display screen 140 may include save configuration option 146 that provides the user with an opportunity to save the user-configured search parameters. The program guide may display

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related-program find display screen 142 when the user selects save configuration option 146 of display screen 140. Display screen 142 is the same display screen as display screen 140 except that display screen 142 5 includes unsave configuration option 148 that provides the user with an opportunity to unsave the user-configured search parameters (e.g., delete the saved user-configured search parameters).

If desired, an arrangement such as that shown 10 in FIG. 7c may be used to search for related programs. Initially, the user may indicate an interest in a given program by selecting a program listing for the given program from an on-screen display of program listings, by pressing an OK button or other remote control button 15 while tuned to the given program (e.g., while tuned to the given program with a set-top box or the like), by selecting the program from the results of a search, etc.

A list of attributes for the given program 20 (such as the attribute list of display screen 300 of FIG. 7c) may be displayed for the user (e.g., by the program guide or other interactive application running on the system). A moveable highlight region such as highlight region 302 or other such indicator may be 25 used to provide the user with an opportunity to select attributes of interest to be used in searching for related programs.

As shown in display screen 304 of FIG. 7c, the user may select one or more attributes (e.g., by 30 pressing a remote control OK button or otherwise selecting desired attributes). The system may display a visual indication of which program attributes have been scheduled. For example, the system may highlight selected attributes, may change their color, text font,

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brightness, etc. or may display an indicator such as indicators 306 to indicate which program attributes have been selected by the user. When the user highlights search option 308 and presses a remote control 5 OK button (or otherwise selects option 308), the system searches for program listings matching the selected program attributes. When plural attributes are selected, the search may be performed using a logical AND or a logical OR function. The search 10 results may be displayed using any suitable on-screen arrangement and may be selectable (for more information, automatic tuning, etc.) if desired.

The arrangement of FIG. 7c is merely illustrative. Any suitable arrangement may be used for 15 providing an on-screen display of program attributes related to a selected program. The attributes may include program genre(s), actors, rating, channel, director, year produced, or any other suitable program attributes. The program attribute information may be 20 provided with the program listings data. In a client-server arrangement, for example, the program attributes may be maintained with program listings data stored on a server located at a cable system headend (or at another suitable location). In configurations in which 25 program listings are stored locally on a set-top box or other user equipment, program attributes may be maintained locally.

Illustrative information display screen 150 and illustrative related-program find search 30 configuration display screen 152 (hereinafter, configuration display screen 152) of FIG. 8a may be provided based on the illustrative steps of FIG. 6. The program guide may display information display screen 150 when a user selects to receive information

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on the Denver Broncos v. Dallas Cowboys football game. Information display screen 150 may include related programs option 154 that provides the user with an opportunity to request that the system locate programs 5 that are related to the Denver Broncos v. Dallas Cowboys football game. The program guide may display configuration display screen 152 when the user selects the related programs options from information display screen 150. Configuration display screen 152 may 10 include an on-screen list of program attributes that are to be configured by the user.

The on-screen program attributes may differ based on the specifics of the given program and based on the category for the given program. For example, 15 for a sports category program, the on-screen list may include attributes that are specific to that sports program and/or include attributes that are related to sports programs in general. As shown, configuration display screen 152 may include the following 20 attributes: other football games, NFL games, Broncos games, Cowboys games, any sporting events, football-related programs, programs with John Elway as guest, etc. The user may then configure the search parameters to require matching programs to be football games, 25 desire NFL games and Broncos games, exclude Cowboys games, ignore whether a program is a sporting event when deciding whether it matches, ignore whether a program is a football related program when deciding whether it matches, and ignore whether a program has 30 John Elway as guest when deciding whether it matches.

Illustrative related program find display screen 158 of FIG. 8b may be provided based on the illustrative steps of FIG. 6. Display screen 158 may be displayed when a user selects search option 156 from

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configuration display screen 152 of FIG. 8a. Display screen 158 of FIG. 8b may include listings that are sorted for display based on the user-configured search parameters of configuration display screen 158. The 5 program guide may display program display screen 160 that contains video of a current program when the user selects a listing for a current program from the program listings contained in related-program find display screen 158. If desired, the program guide may 10 display information display screen 162 for a program when the user selects a program listing from the program listings contained in related-program find display screen 158.

If desired, the listings in related-program 15 find display screen 158 may include program title, air time, channel, rating, pay-per-view information, etc.

Illustrative steps for an interactive television system such as interactive television program guide system 50 of FIG. 1 involved in providing 20 the illustrative display screens of FIG. 8b are shown in FIG. 9. At step 164, the program guide may display a display screen having on-screen program listings that are related to a given program. Step 164 may include step 166 in which the program may provide the user with 25 an opportunity to select one of the on-screen program listings. At step 168, the program guide may tune to a channel for a current program when the user selects one of the on-screen listings that is for a current program. At step 170, the program guide may display an 30 information display screen for a selected on-screen listing when the user selects that on-screen listing. At step 172, the program guide may return the user to viewing television or to an earlier display screen when the user exits from the display screen having the

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related on-screen program listings (e.g., presses an exit or back key of a remote control).

Illustrative steps for an interactive television system such as interactive television 5 program guide system 50 of FIG. 1 involved in displaying a list of saved searches are shown in FIG. 10a. At step 174, the program guide may provide the user with an opportunity to select a saved search option. At step 176, the program guide may display a 10 display screen having a list of saved searches when a user selects the saved search option.

Illustrative main menu display screen 178 and 15 illustrative saved searches display screen 180 of FIG. FIG. 10a. The program guide may display main menu display screen 178 to provide a main selection menu for accessing program guide features. Main menu display screen 178 may include saved searches option 182. The program guide may display saved searches display screen 20 180 when the user selects saved searches option 182. Saved searches display screen 180 may include a list of saved-searches that are identified on the screen using the given program title for each saved search. When 25 two saved searches are for two programs with the same title, the program guide may use numbering to distinguish the listings. If desired, the user may have been allowed to name the saved searches. For example, the program guide may have provided the user with an opportunity to enter a name (e.g., by selecting 30 or entering alphanumeric letters with a user interface device) for a search that a user is directing the program guide to save. The saved searches may be selected by the user to provide the user with an opportunity to search current program listings using

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search parameters that were user-configured in an earlier search of program listings.

Illustrative steps for an interactive television system such as interactive television 5 program guide system 50 of FIG. 1 involved in displaying a list of saved searches are shown in FIG. 11. At step 184, the program guide may display a display screen having a list of saved searches. At step 186, the program guide may provide a user with an 10 opportunity to select a saved search. At step 188, the program guide may display a list of programs based on a search of currently available program listings with saved search parameters from an earlier search.

At step 190, the program guide may provide 15 the user with an opportunity to delete a saved search from the list of saved searches. At step 192, the program guide may delete a particular saved search when the user selects to delete that particular saved search.

20 At step 194, the program guide may provide the user with an opportunity to select an option to view user-configured search parameters for a saved search. At step 196, the program guide may display a display screen having user-configured search parameters 25 for a saved search when the user selects to view user-configured search parameters for that saved search. If desired, step 196 may include a step that provides the user with the opportunity to modify the save searches.

At step 198, the program guide may provide 30 the user with an opportunity to set (or remove) an automatic notification for programs that have been located using a saved search. At step 200, the program guide may display a notice that a located program is scheduled to air when the user has selected to receive

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automatic notifications. If desired, step 200 may include a step that provides the user with the opportunity to act on it.

Illustrative saved searches display screen 5 202 and illustrative related-program find display screen 204 of FIG. 12 may be provided based on the illustrative steps of FIG. 11. Saved searches display screen 202 may include a list of saved searches and corresponding options, including a search option, for 10 each saved search. The program guide may display related program find display screen 204 when the users selects the search option for Search #4. Related program find display screen 204 may include a list of current program listings based on the user-configured 15 search parameters for Search #4.

Illustrative saved searches display screens 206 and 208 of FIG. 13 may be provided based on the illustrative steps of FIG. 11. The program guide may display saved searches display screen 206 that includes 20 a delete option for Search #3. The program guide may display saved searches display screen 208 that does not include Search #3 when the user selects the delete option for Search #3.

Illustrative display screen 214 and 25 illustrative saved searches display screens 210 and 212 of FIG. 14 may be provided based on the illustrative steps of FIG. 11. The program guide may display saved searches display screen 210 that includes an automatic notification option for saved searches including Search 30 #5. The automatic notification option for search #5 may initially be off. The program guide may display saved searches display screen 212 that includes an indication that the automatic notification for Search #5 is on when the user selects the automatic

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notification option for Search #5 from display screen 210. After the user exits saved searches display screen 212 and resumes watching television, the program guide may display automatic notification overlay 216 in 5 display screen 214 when the program guide locates a program (e.g., the movie Terminator) using the user-configured search parameters for Search #5. If desired, the program guide may provide a notification display screen for the located program. The 10 notification may be displayed when the program is about to air or is airing. The overlay 216 may include a tune option (for tuning to the channel airing that program), an information option (for display further information on that program), a saved searches option 15 (for displaying a saved searches display screen), an order option (for ordering programs), etc.

Illustrative saved searches display screen 218 and illustrative saved search configuration display screen 220 of FIG. 15 may be provided based on the 20 illustrative steps of FIG. 11. The program guide may display saved searches display screen 220 having an option that provides the user with an opportunity to view search parameters for saved searches. The program guide may display saved search configuration display 25 screen 222 for Search #3 when the user selects the option to view search parameters for Search #3. Saved search configuration display screen 222 may display the saved user-configured search parameters for Search #3, a modify configuration option (to allow the user to 30 adjust the search parameters), and a search option (to search the current program listings based on the user-configured search parameters). If desired, the program guide may provide the user with an opportunity to modify the settings on this screen by highlighting and

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changing them, rather than having to first select a "modify" option.

Illustrative saved searches display screen 224 and illustrative saved search configuration display screen 226 of FIG. 16 may be provided based on the illustrative steps of FIG. 11. The program guide may display saved searches display screen 224 that includes a list of saved searches when a user selects a saved searches option (e.g., saved searches option 182 of FIG. 10b). The program guide may display saved search configuration display screen 226 when the user selects a saved search from saved searches display screen 224. Saved search configuration display screen 226 may include on-screen search settings for the selected saved search. The program guide may provide the user with an opportunity to navigate to any of the settings and to modify them. Saved search configuration, display screen 226 may include search option 228 that when selected, causes the program guide to display a list of matching programs, rename option 230 that allows the user to enter a name (or modify the name) for the selected saved search, delete option 232 that when selected, deletes the selected save search, automatic notification option 234 that provides an automatic notification of programs matching the selected saved search, etc. Automatic Notification option 234 may include an indicator 236 to indicate that option 234 is on.

The foregoing is merely illustrative of the principles of this invention and various modifications can be made by those skilled in the art without departing from the scope and spirit of the invention.

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What is Claimed is:

1. A method for searching for television program listings, comprising:
  - providing a user with an opportunity to indicate an interest in a given program;
  - displaying an on-screen list of attributes related to the program;
  - providing the user with an opportunity to select one of the attributes; and
  - displaying a list of program listings related to the selected attribute.
2. The method defined in claim 1, wherein providing the user with the opportunity to indicate an interest in the given program comprises providing the user with an opportunity to select a program listing for the given program from an on-screen display of program listings.
3. The method defined in claim 1, wherein providing the user with the opportunity to indicate an interest in the given program comprises providing the user with an opportunity to indicate an interest in a program that is currently being displayed.
4. The method defined in claim 1, further comprising:
  - providing the user with an opportunity to select a plurality of attributes; and
  - displaying in the list program listings that are related to the selected attributes.

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5. The method defined in claim 1, further comprising providing the user with an opportunity to select program listings from the list.

6. An interactive television program guide system for searching for television program listings, comprising:

user television equipment on which an interactive television program guide is at least partially implemented, wherein the user television equipment is configured to provide a user with an opportunity to indicate an interest in a given program, to display an on-screen list of attributes related to the program, to provide the user with an opportunity to select one of the attributes, and to display a list of program listings related to the selected attribute.

7. The system defined in claim 6, wherein the user television equipment is further configured to provide the user with the opportunity to indicate an interest in the given program by being configured to provide the user with an opportunity to select a program listing for the given program from an on-screen display of program listings.

8. The system defined in claim 6, wherein the user television equipment is further configured to provide the user with the opportunity to indicate an interest in the given program by being configured to provide the user with an opportunity to indicate an interest in a program that is currently being displayed.

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9. The system defined in claim 6, wherein the user television equipment is further configured to provide the user with an opportunity to select a plurality of attributes, and to display in the list program listings that are related to the selected attributes.

10. The system defined in claim 6, wherein the user television equipment is further configured to provide the user with an opportunity to select program listings from the list.

11. A method for use in an interactive television program guide system having user television equipment and a remote control for interfacing with said user television equipment, said method being for searching for programs, comprising:

displaying a display screen that includes a video for a given program;

allowing the user to use a single key on the remote control while the video for the given program is being displayed to direct the program guide system to locate program listings related to the given program; and

displaying a display screen including the program listings located by the system.

12. The method defined in claim 11, further comprising sorting the program listings located by the system for display.

13. The method defined in claim 11, further comprising providing the user with an opportunity to select any of the displayed program listings.

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14. The method defined in claim 13, further comprising tuning to a particular program when the user selects a listing for the particular program from the displayed listings.

15. The method defined in claim 13, further comprising tuning to a current program when the user selects a particular one of the displayed listings that lists a current program.

16. The method defined in claim 13, further comprising displaying an information display screen that contains information related to a particular one of the displayed listing when the user selects that particular listing.

17. The method defined in claim 11, further comprising locating programs based on attributes of the given program.

18. An interactive television program guide system for searching for programs, comprising:

a remote control that is configured to interface with user television equipment;

user television equipment on which an interactive television program guide is at least partially implemented, wherein the user television equipment is configured to display a display screen that includes a video for a given program, to allow the user to use a single key on the remote control while the video for the given program is being displayed to direct the program guide system to locate program listings related to the given program, and to display a

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display screen that includes the program listings located by the system.

19. The system defined in claim 18, wherein the user television equipment is further configured to sort the program listings located by the system for display.

20. The system defined in claim 18, wherein the user television equipment is further configured to provide the user with an opportunity to select any of the displayed program listings.

21. The system defined in claim 20, wherein the user television equipment is further configured to tune to a particular program when the user selects a listing for the particular program from the displayed listings.

22. The system defined in claim 20, wherein the user television equipment is further configured to tune to a current program when the user selects a particular one of the displayed listings that lists a current program.

23. The system defined in claim 20, wherein the user television equipment is further configured to display an information display screen that contains information related to a particular one of the displayed listing when the user selects that particular listing.

24. The system defined in claim 18, wherein the user television equipment is further configured to

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locate programs based on attributes of the given program.

25. A method for use in an interactive television program guide system having user television equipment and a remote control for interfacing with said user television equipment, said method being for searching for programs, comprising:

displaying a display screen that includes a video for a given program;

allowing the user to use a single key on the remote control while the video for the given program is being displayed to direct the program guide system to display a display screen containing a plurality of program attributes for the given program;

providing the user with an opportunity to assign various importance levels to the program attributes on the display screen; and

displaying a selectable search option on the same display screen as the program attributes and assigned importance levels that the user selects to direct the program guide system to locate program listings related to the given program based on the program attributes and their assigned importance levels.

26. The method defined in claim 25, further comprising providing the user with an opportunity to have the program guide system save the plurality of program attributes for the given program.

27. The method defined in claim 26, further comprising providing the user with an opportunity to have the program guide system save the plurality of

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program attributes for the given program and their assigned importance levels.

28. The method defined in claim 26, further comprising providing the user with an opportunity to delete the saved plurality of program attributes for the given program.

29. The method defined in claim 25, further comprising displaying a list of program listings that the program guide system located based on the attributes and their assigned importance levels.

30. The method defined in claim 29 further comprising providing the user with an opportunity to select program listings from the list.

31. The method defined in claim 30, further comprising displaying information related to a particular program listing that has been selected from the list.

32. The method defined in claim 30, further comprising tuning to a particular program when a listing for the particular program is selected from the list.

33. An interactive television program guide system, comprising:

a remote control that is configured to interface with user television equipment; and

user television equipment on which an interactive television program guide is at least partially implemented, wherein the user television

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equipment is configured to display a display screen that includes a video for a given program, to allow the user to use a single key on the remote control while the video for the given program is being displayed to direct the program guide system to display a display screen containing a plurality of program attributes for the given program, to provide the user with an opportunity to assign various importance levels to the program attributes on the display screen, and to display a selectable search option on the same display screen as the program attributes and assigned importance levels that the user selects to direct the program guide system to locate program listings related to the given program based on the program attributes and their assigned importance levels.

34. The system defined in claim 33, wherein the user television equipment is further configured to provide the user with an opportunity to have the program guide system save the plurality of program attributes for the given program.

35. The system defined in claim 34, wherein the user television equipment is further configured to provide the user with an opportunity to have the program guide system save the plurality of program attributes for the given program and their assigned importance levels.

36. The system defined in claim 34, wherein the user television equipment is further configured to provide the user with an opportunity to delete the saved plurality of program attributes for the given program.

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37. The system defined in claim 33, wherein the user television equipment is further configured to display a list of program listings that the program guide system located based on the attributes and their assigned importance levels.

38. The system defined in claim 37, wherein the user television equipment is further configured to provide the user with an opportunity to select program listings from the list.

39. The system defined in claim 38, wherein the user television equipment is further configured to display information related to a particular program listing that has been selected from the list.

40. The system defined in claim 38, wherein the user television equipment is further configured to tune to a particular program when a listing for the particular program is selected from the list.

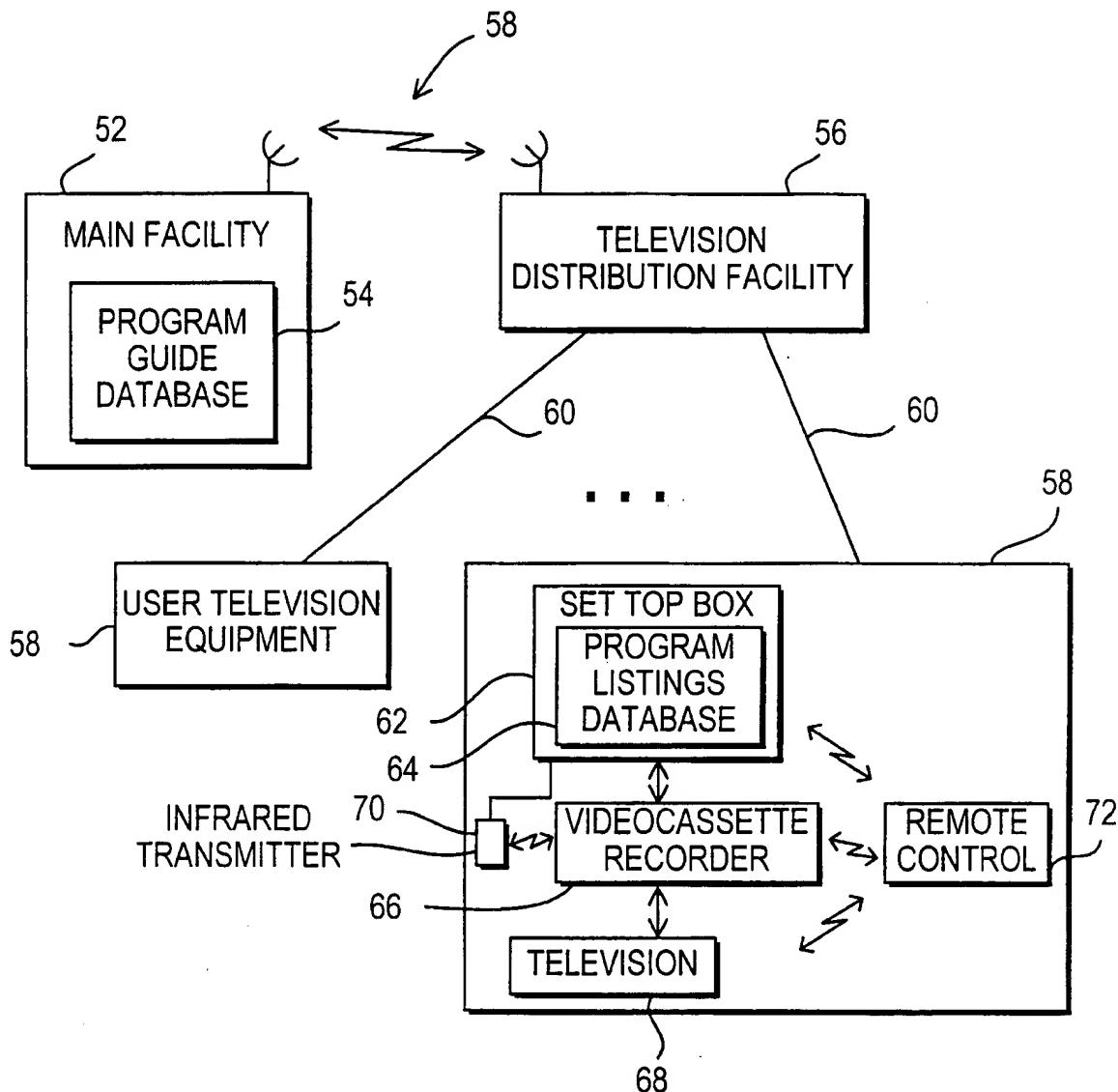


FIG. 1

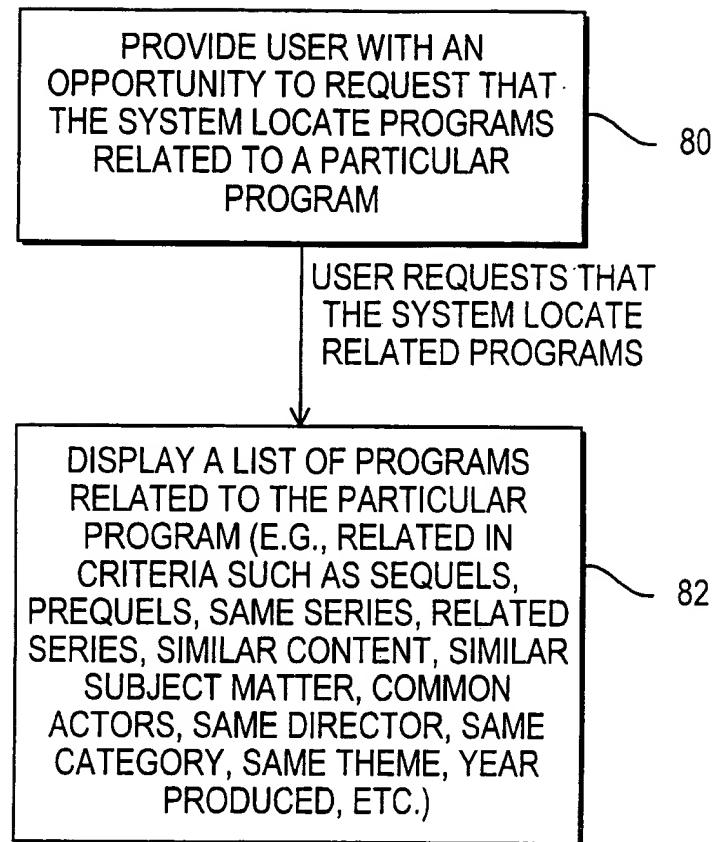
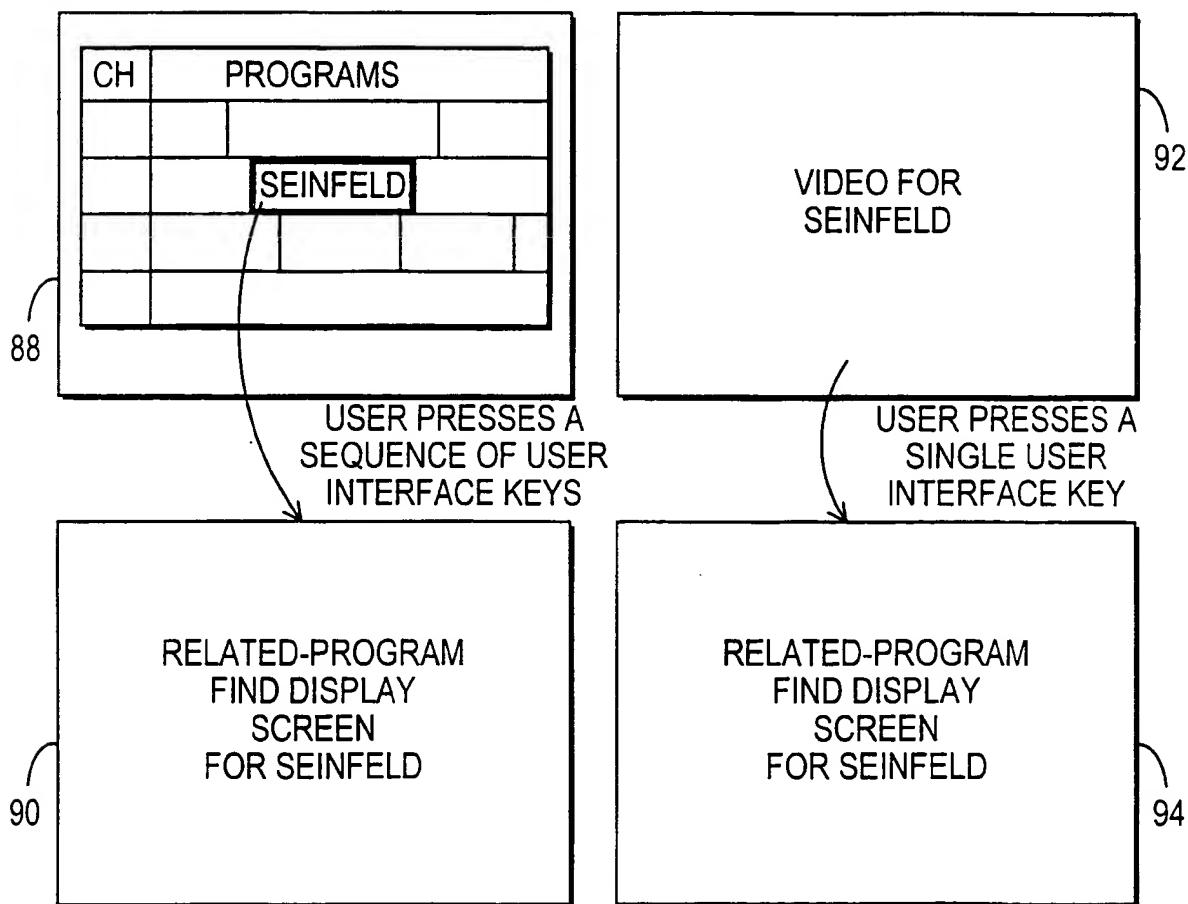
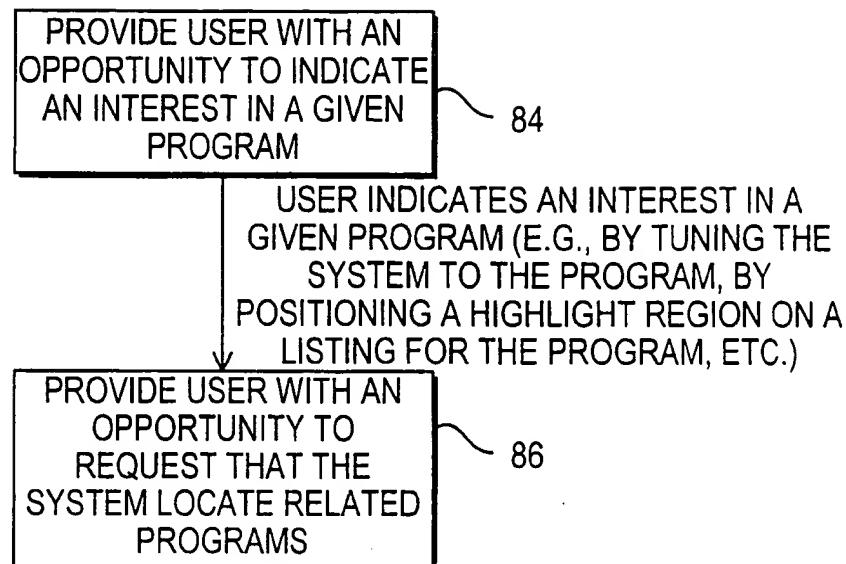


FIG. 2

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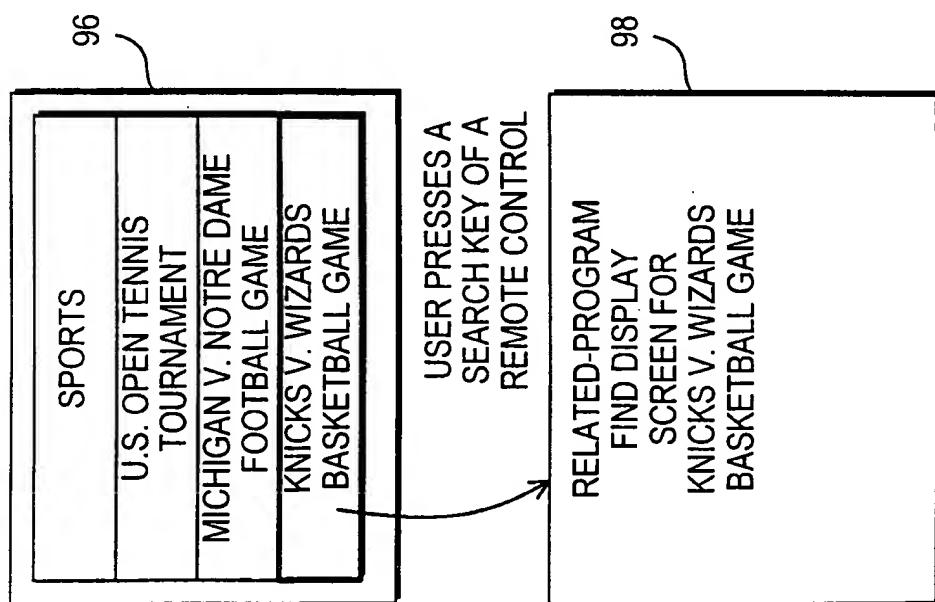
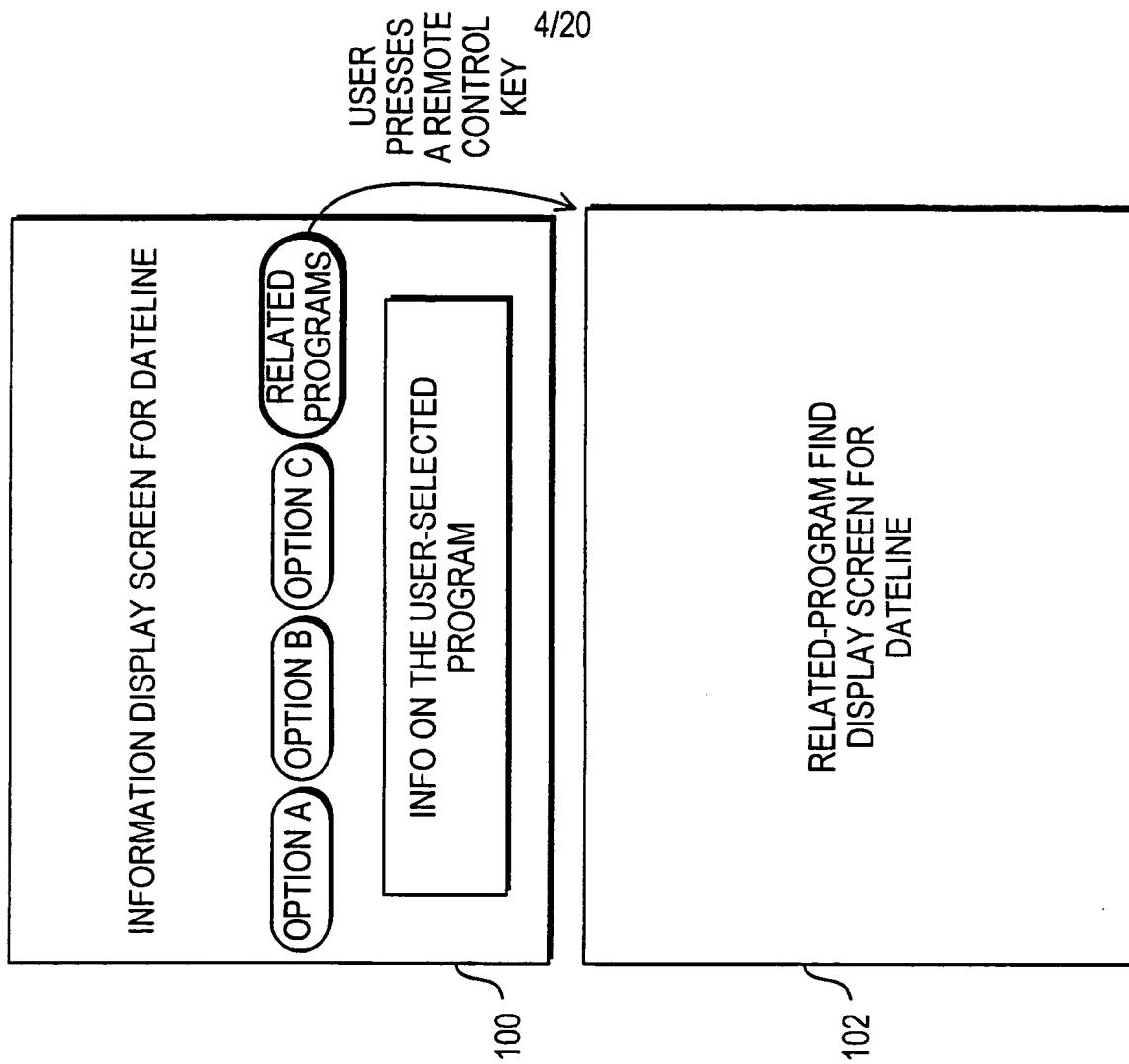


FIG. 3D

FIG. 3E

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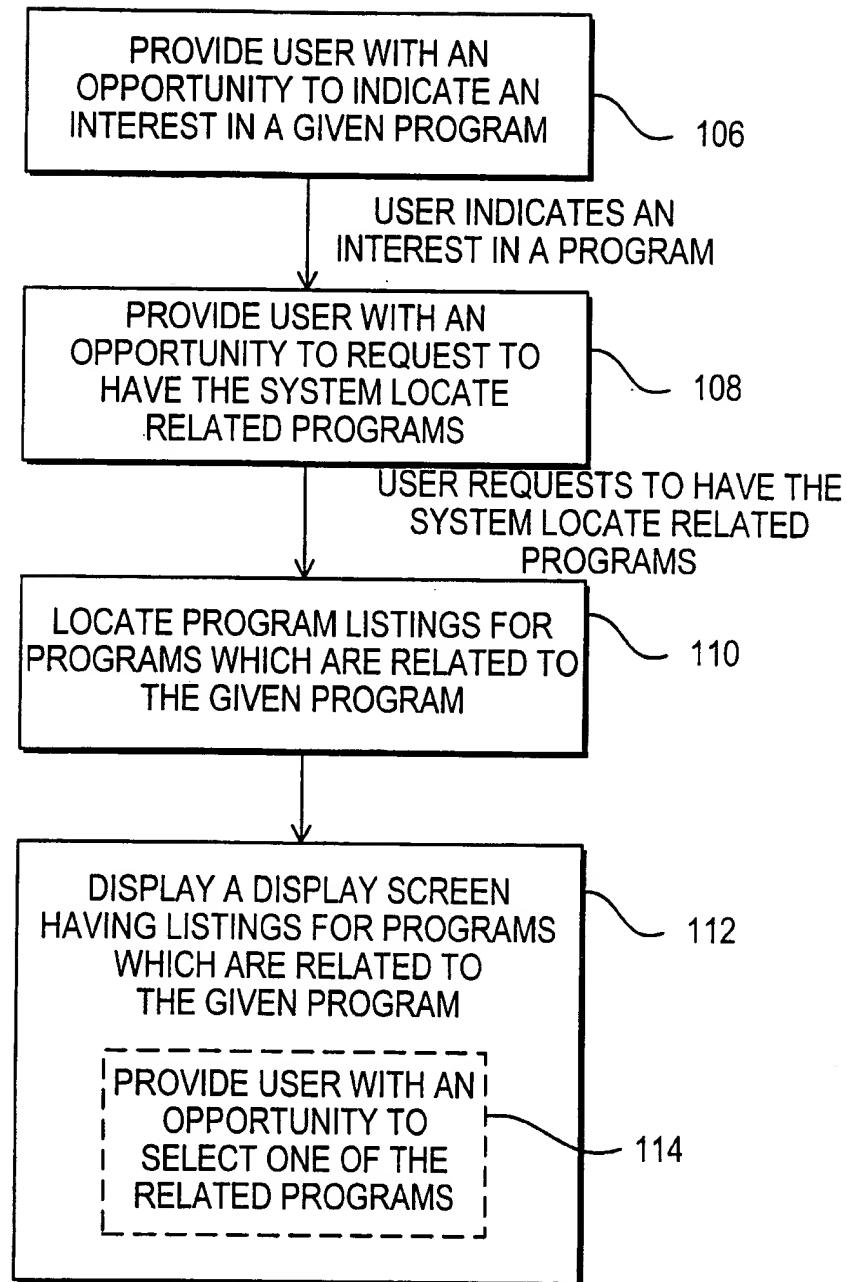


FIG. 4

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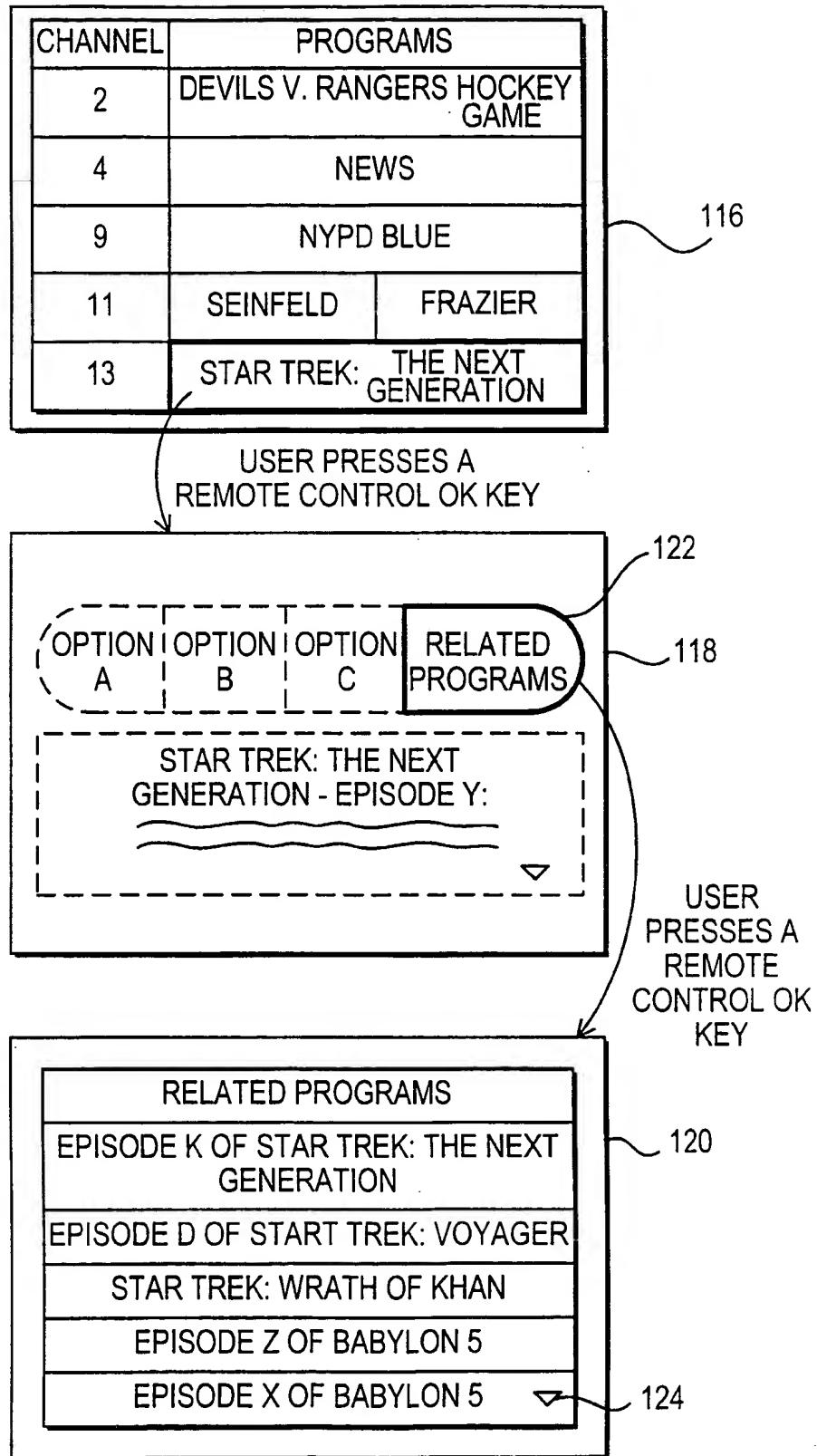
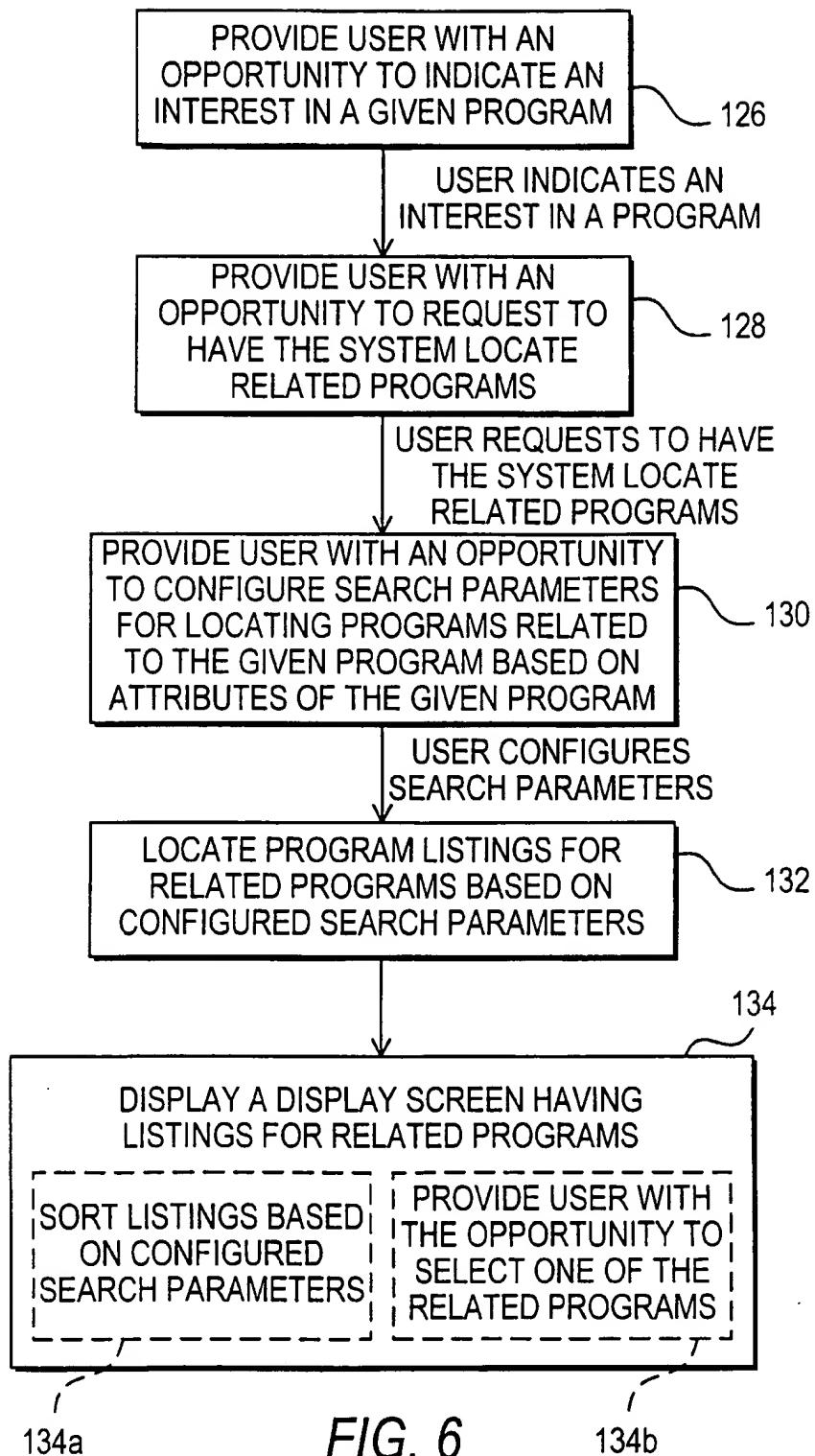


FIG. 5

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USER TUNES TO STAR TREK: THE  
NEXT GENERATION

VIDEO OF STAR TREK : THE  
NEXT GENERATION

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USER SELECTS A  
SINGLE REMOTE  
CONTROL KEY

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STAR TREK: THE NEXT GEN. REQUIRED <> DESIRED <> IGNORE <> EXCLUDE  
STAR TREK REQUIRED <> DESIRED <> IGNORE <> EXCLUDE  
STAR TREK MOVIES REQUIRED <> DESIRED <> IGNORE <> EXCLUDE  
SCIENCE FICTION REQUIRED <> DESIRED <> IGNORE <> EXCLUDE  
SERIES REQUIRED <> DESIRED <> IGNORE <> EXCLUDE  
PATRICK STEWART REQUIRED <> DESIRED <> IGNORE <> EXCLUDE  
JONATHAN FRAKES REQUIRED <> DESIRED <> IGNORE <> EXCLUDE

SEARCH

USER SELECTS  
SEARCH

FIG. 7A

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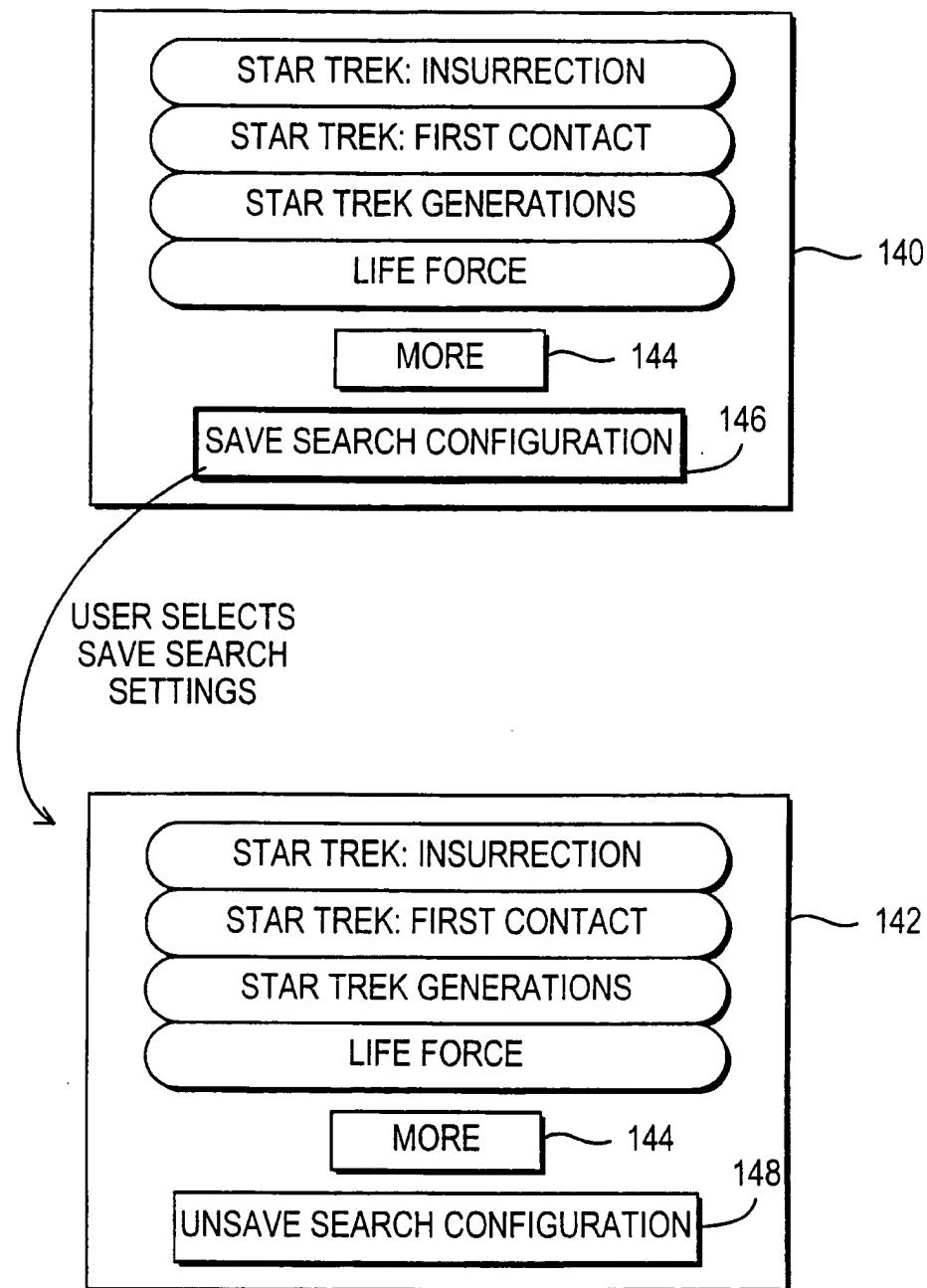


FIG. 7B

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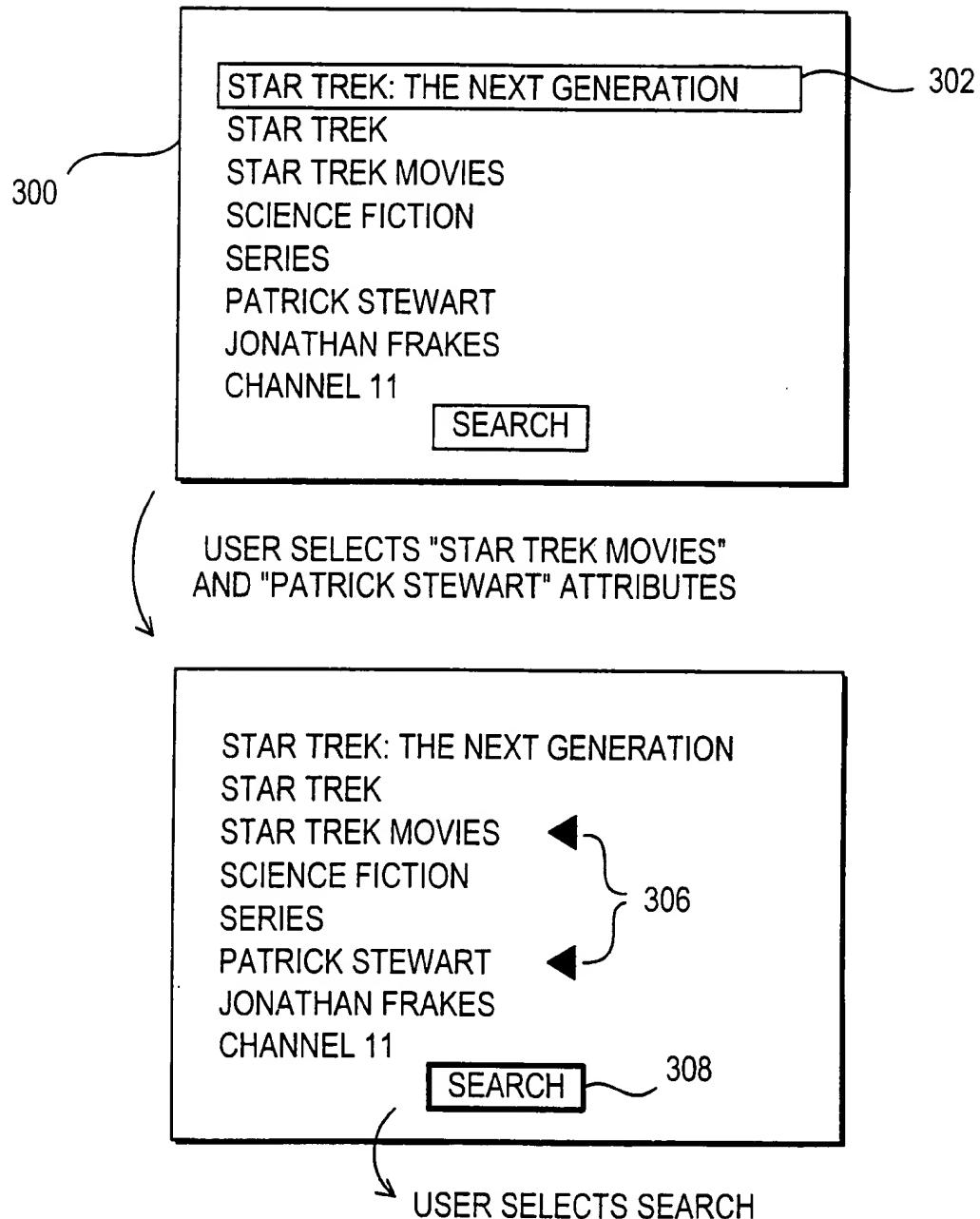
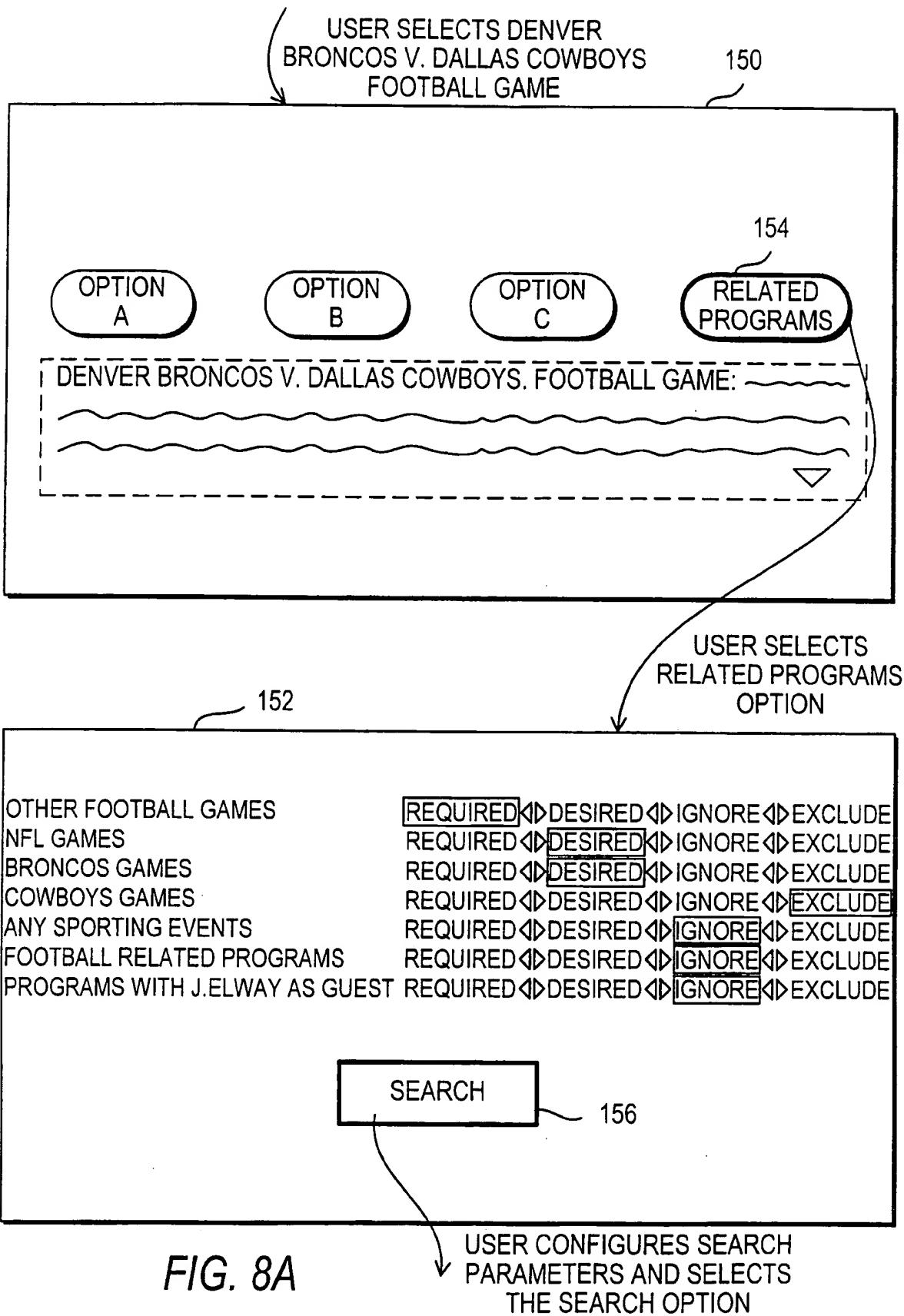


FIG. 7C

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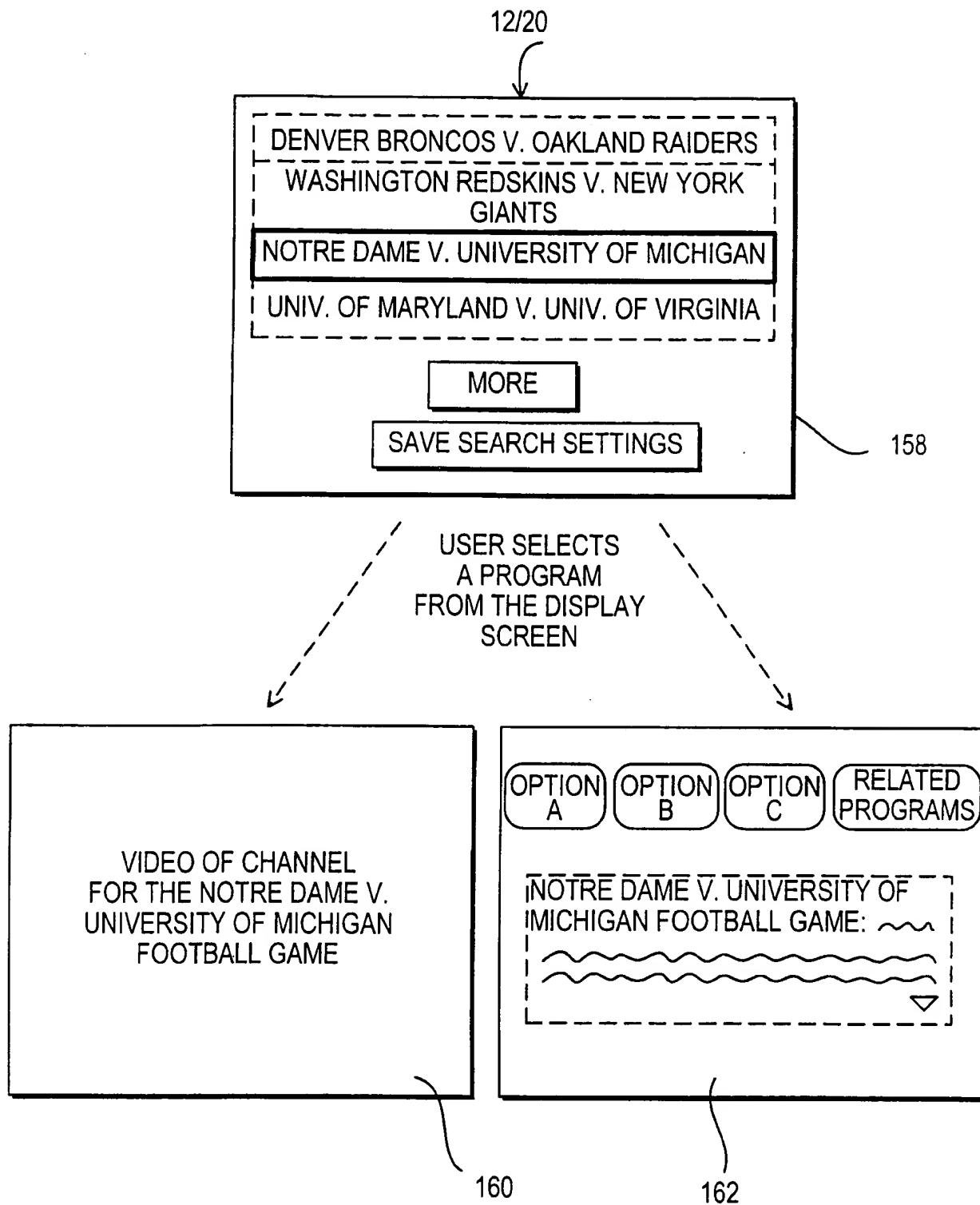


FIG. 8B

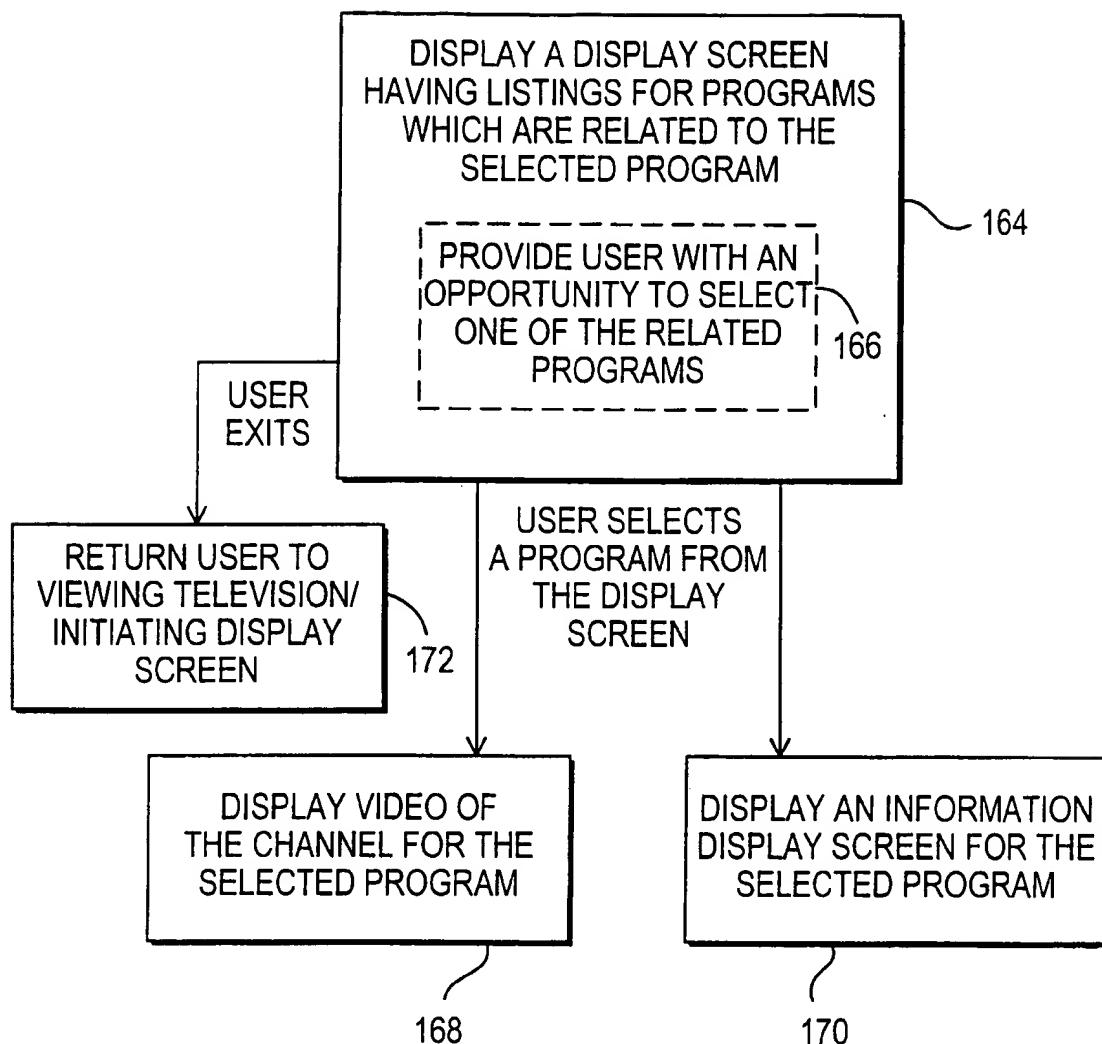


FIG. 9

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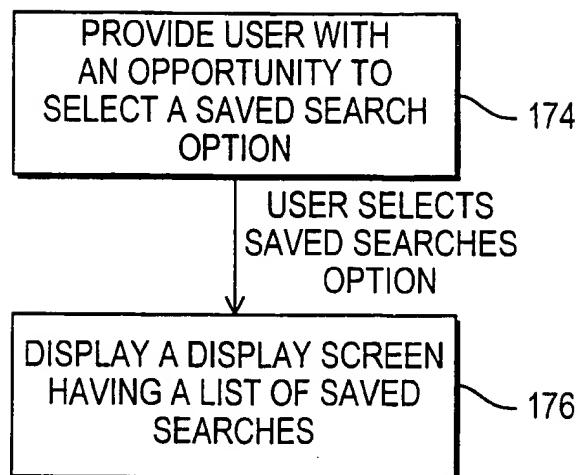


FIG. 10A

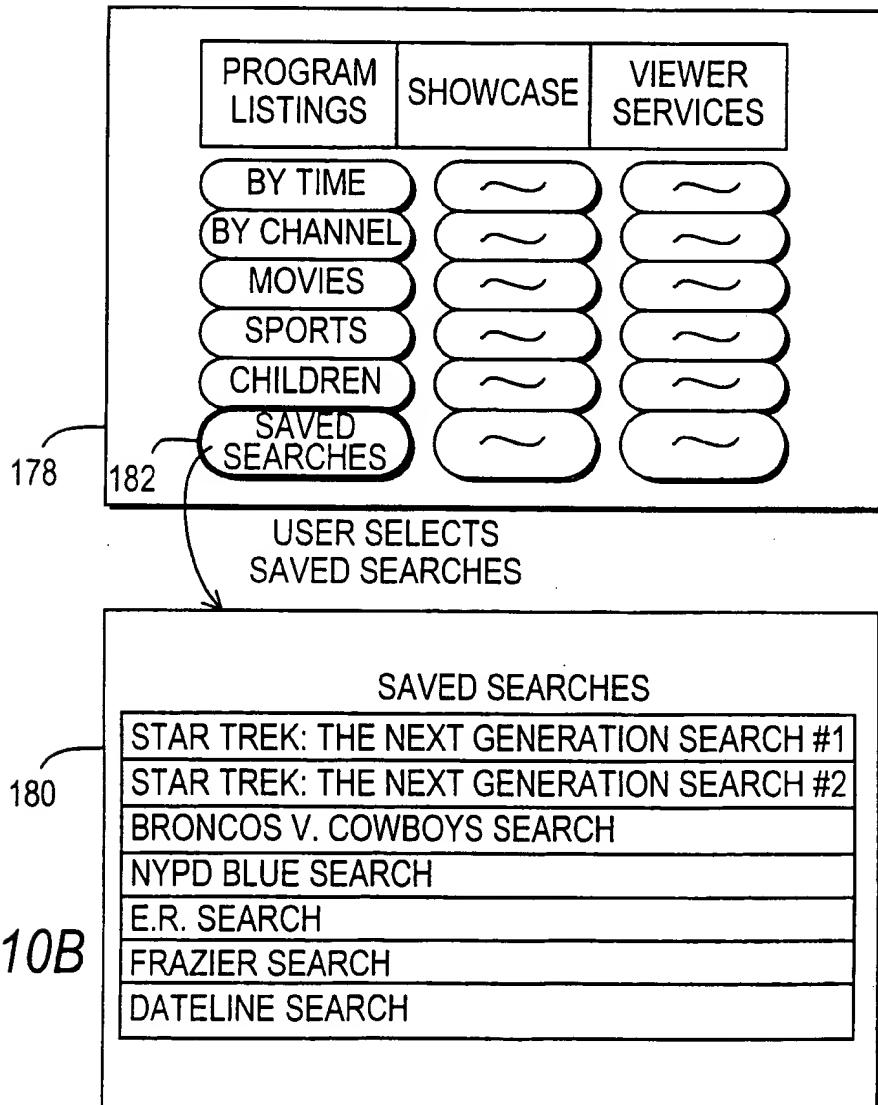


FIG. 10B

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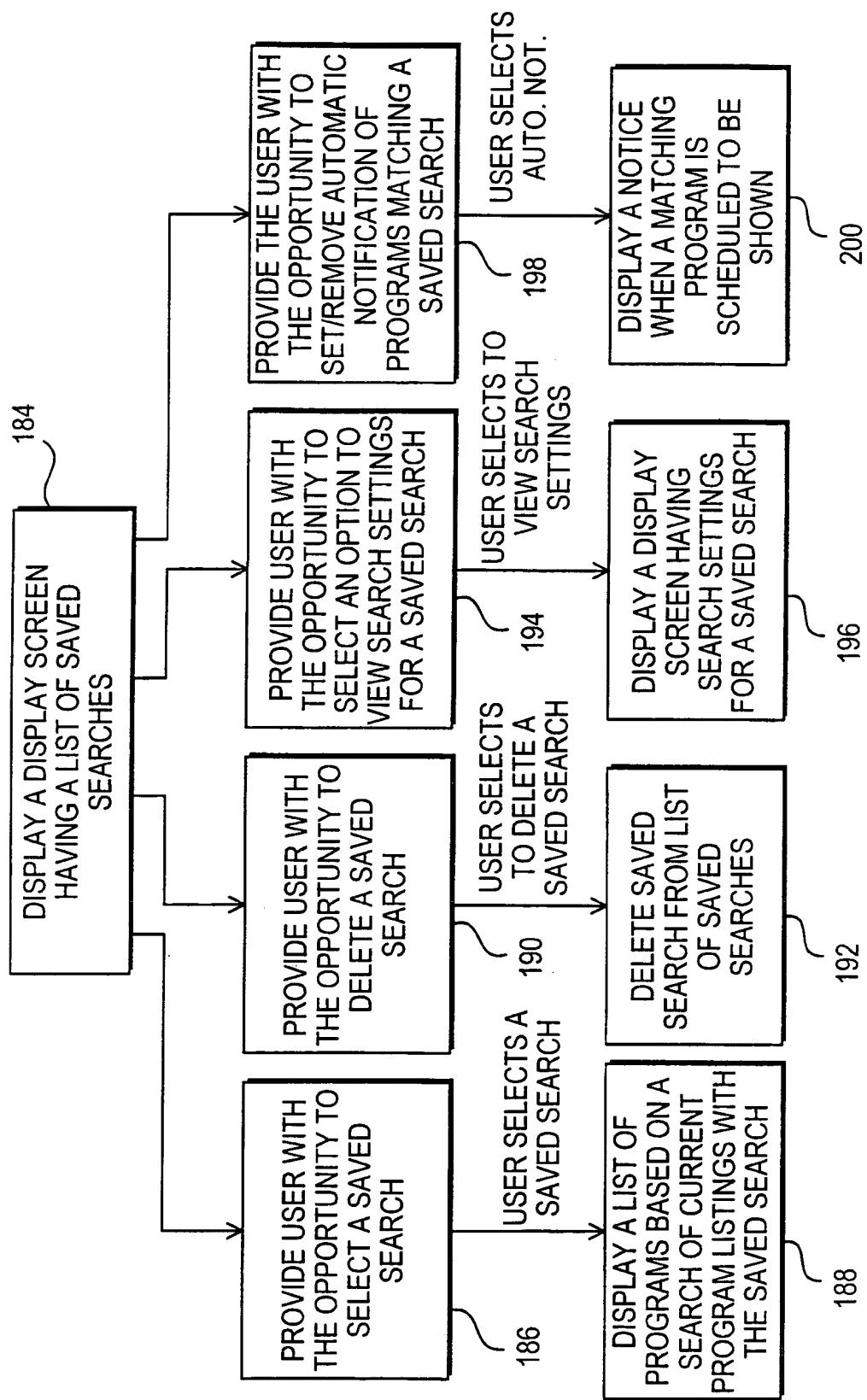


FIG. 11

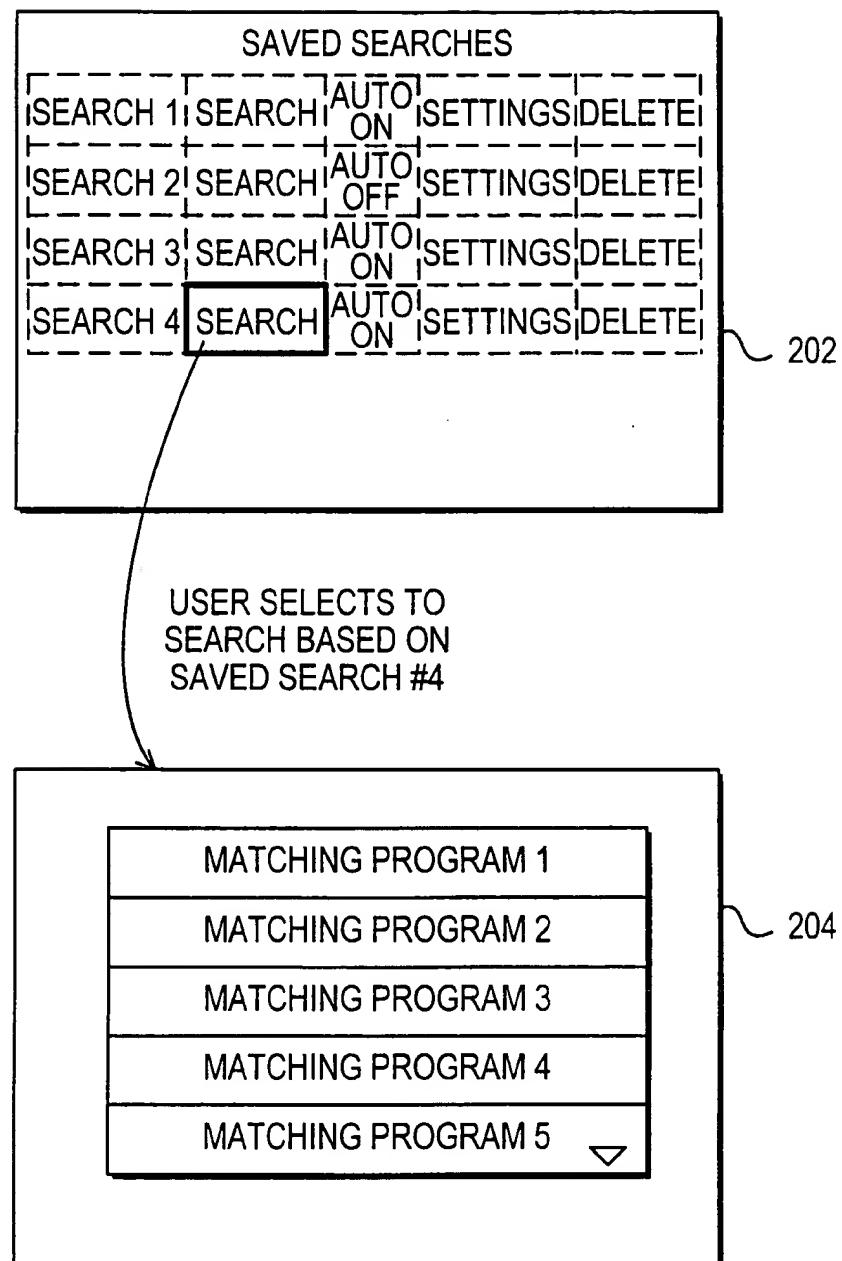


FIG. 12

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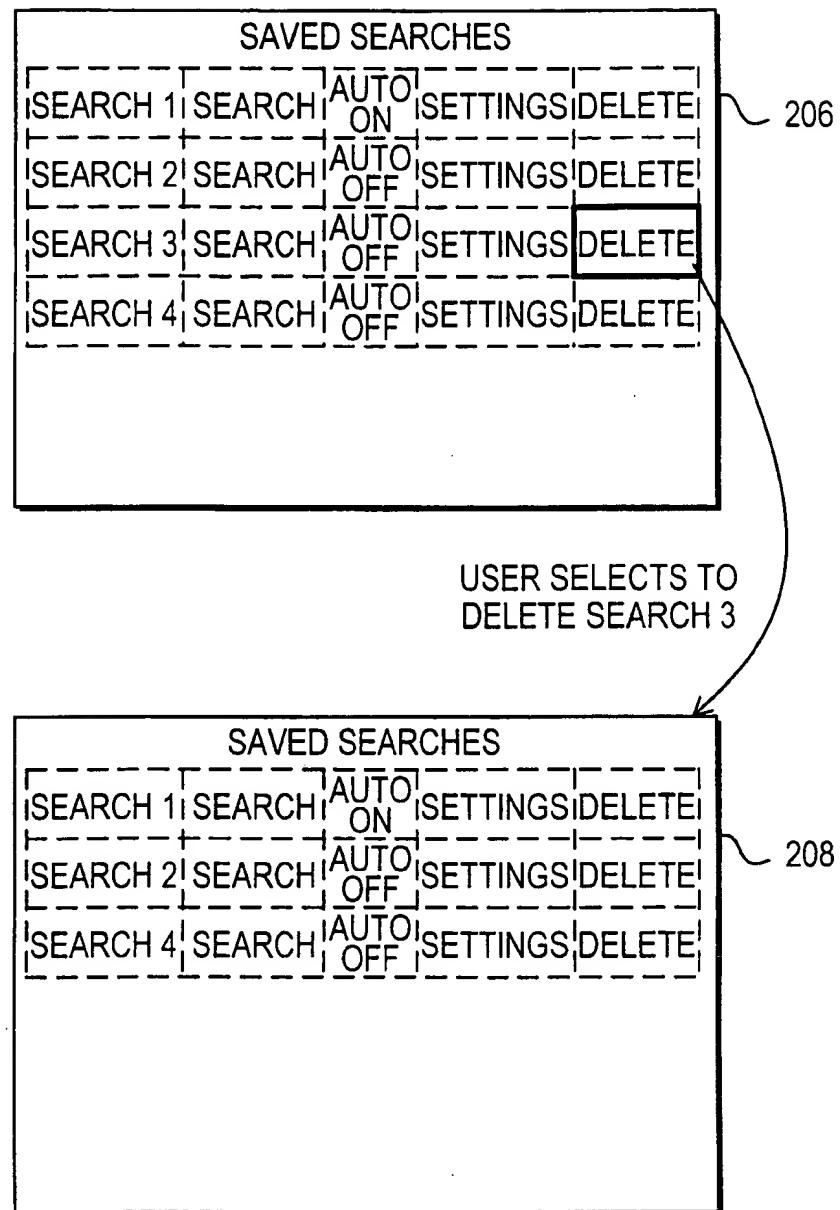


FIG. 13

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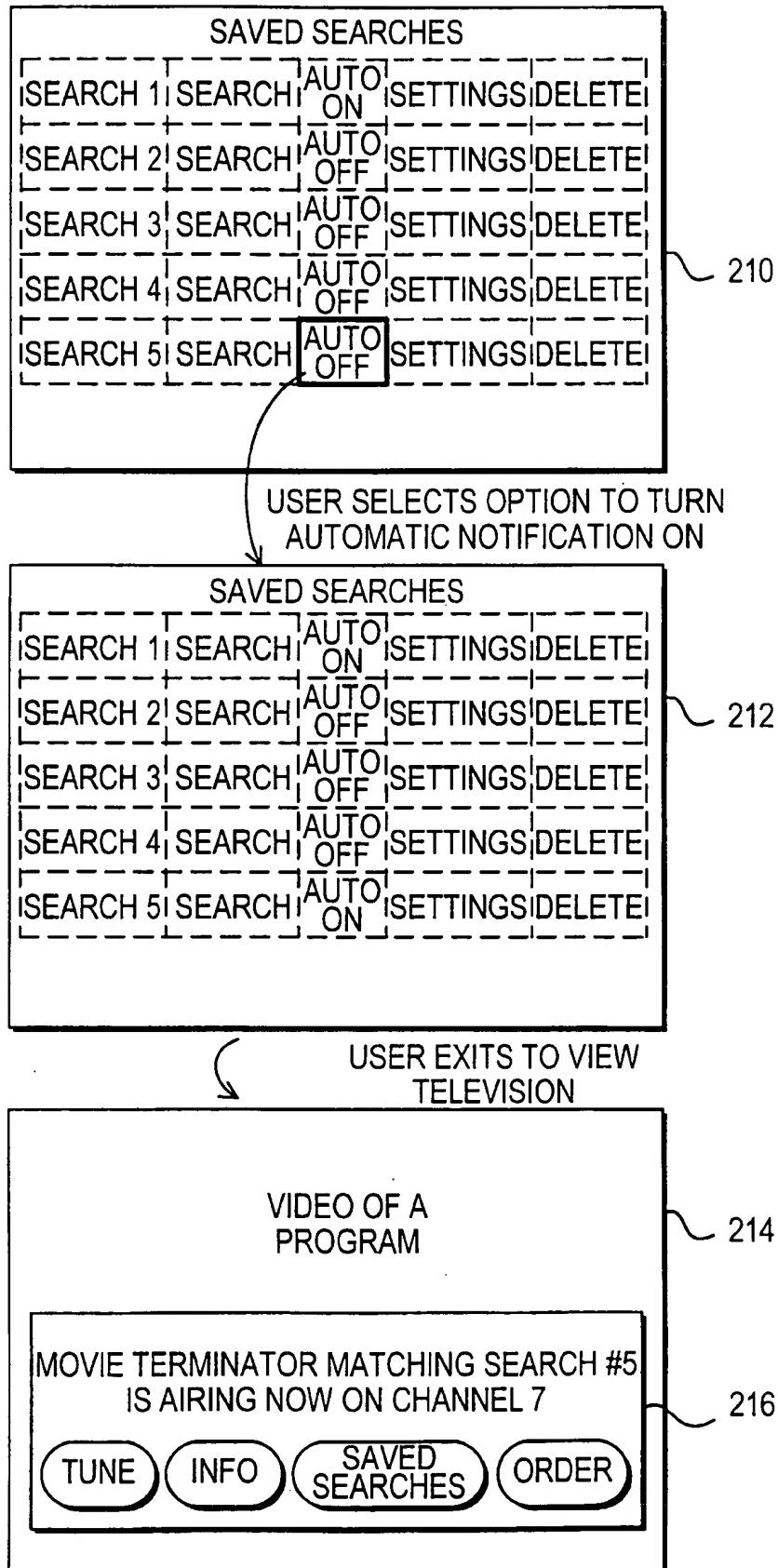


FIG. 14

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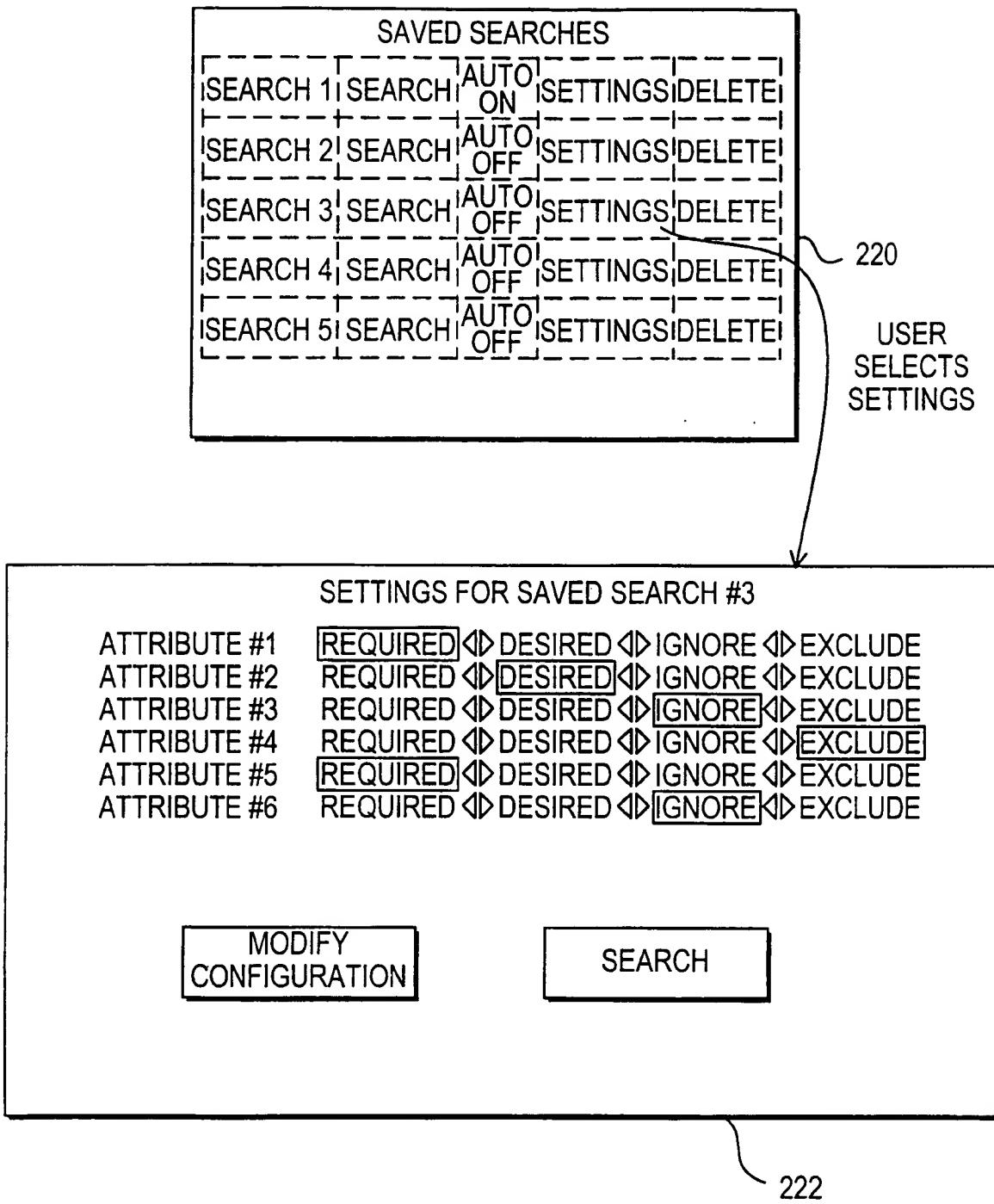


FIG. 15

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## SAVED SEARCHES

|                                          |
|------------------------------------------|
| STAR TREK: THE NEXT GENERATION SEARCH #1 |
| STAR TREK: THE NEXT GENERATION SEARCH #2 |
| BRONCOS V. COWBOYS SEARCH                |
| NYPD BLUE SEARCH                         |
| E.R. SEARCH                              |
| FRAZIER SEARCH                           |
| DATELINE SEARCH                          |

USER SELECTS A SAVED SEARCH

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## START TREK THE NEXT GENERATION SEARCH #2

|                          |          |         |        |         |
|--------------------------|----------|---------|--------|---------|
| STAR TREK: THE NEXT GEN. | REQUIRED | DESIRED | IGNORE | EXCLUDE |
| STAR TREK                | REQUIRED | DESIRED | IGNORE | EXCLUDE |
| STAR TREK MOVIES         | REQUIRED | DESIRED | IGNORE | EXCLUDE |
| SCIENCE FICTION          | REQUIRED | DESIRED | IGNORE | EXCLUDE |
| SERIES                   | REQUIRED | DESIRED | IGNORE | EXCLUDE |
| PATRICK STEWART          | REQUIRED | DESIRED | IGNORE | EXCLUDE |
| JONATHAN FRAKES          | REQUIRED | DESIRED | IGNORE | EXCLUDE |

SEARCH

RENAME

DELETE

AUTO  
ON

228

230

232

234

FIG. 16

## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 99/28402A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 H04N5/445

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document, with indication, where appropriate, of the relevant passages                                          | Relevant to claim No. |
|----------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------|
| X        | EP 0 854 645 A (TEXAS INSTRUMENTS INC)<br>22 July 1998 (1998-07-22)<br>column 2, line 13 - line 26                          | 1,2,4,6               |
| A        | column 10, line 12 -column 19, line 33;<br>figures 3-5                                                                      | 7,9,11,<br>18,25,33   |
| X        | US 5 617 565 A (AUGENBRAUN JOSEPH E ET<br>AL) 1 April 1997 (1997-04-01)<br>column 5, line 62 -column 6, line 55;<br>claim 1 | 1,6                   |
| A        | —                                                                                                                           | 2-4,7-40              |
| X        | WO 97 48230 A (STARLIGHT TELECAST INC)<br>18 December 1997 (1997-12-18)<br>page 2, line 10 - line 11                        | 1,6                   |
| A        | page 15, line 34 -page 23, line 29; claims<br>1,2,15; figures 7-12                                                          | 2-40                  |
| A        | —                                                                                                                           | 11                    |
|          |                                                                                                                             | —/—                   |

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

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- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the International filing date but later than the priority date claimed

- \*T\* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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- \*&\* document member of the same patent family

Date of the actual completion of the international search

9 May 2000

Date of mailing of the International search report

16/05/2000

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## Authorized officer

Fuchs, P

## INTERNATIONAL SEARCH REPORT

International / cation No  
PCT/US 99/28402

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document, with indication, where appropriate, of the relevant passages                                                                           | Relevant to claim No.     |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
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| A        | column 6, line 48 -column 7, line 11;<br>figure 4                                                                                                            | 14,15,<br>21,22,<br>25,33 |
| A        | EP 0 774 866 A (THOMSON CONSUMER<br>ELECTRONICS) 21 May 1997 (1997-05-21)<br>column 1, line 1 - line 41<br>column 3, line 24 -column 5, line 27;<br>figure 4 | 25,33                     |
|          | —                                                                                                                                                            | 11,18,<br>25,33           |

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No  
PCT/US 99/28402

| Patent document cited in search report | Publication date | Patent family member(s) |                                                  | Publication date                                     |
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| EP 0774866                             | A 21-05-1997     | US<br>BR<br>JP<br>SG    | 5867226 A<br>9605543 A<br>9200638 A<br>49982 A   | 02-02-1999<br>11-08-1998<br>31-07-1997<br>15-06-1998 |